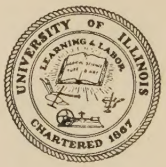
THE AMERICAN YEAR BOOK

RECORD OF THE YEAR

1928

UNIVERSITY OF ILLINOIS
UNDERGRADUATE DIVISION
CHICAGO
LIBRARY



THE AMERICAN YEAR BOOK

THE AMERICAN YEAR BOOK

A Record of Events and Progress

YEAR 1928

EDITOR

ALBERT BUSHNELL HART, LL.D.

ASSOCIATE EDITOR

WILLIAM M. SCHUYLER

EDITED WITH THE COOPERATION OF
A SUPERVISORY BOARD REPRESENTING NATIONAL LEARNED SOCIETIES

NEW YORK
THE AMERICAN YEAR BOOK CORPORATION
229 WEST 43RD STREET
1929

U OF I
LIBRARY

ACKNOWLEDGMENT

THE AMERICAN YEAR BOOK FOR THE YEAR 1928 HAS BEEN FINANCED BY THE NEW YORK TIMES AND ITS PUBLISHER, MR. ADOLPH S. OCHS.

COPYRIGHT, 1929
BY THE AMERICAN YEAR BOOK CORPORATION
All rights reserved

Printed in the United States of America by
J. J. LITTLE AND IVES COMPANY, NEW YORK

E
171
A585
1928
v.1/c

PREFACE

THE AMERICAN YEAR BOOK, in each of its annual issues, summarizes for the preceding year the progress made in America in the arts, sciences, social conditions, and humanities. It is an authoritative compilation of American achievement.

This enterprise is made possible by the support and devotion to the reading public of *The New York Times* and its publisher, Mr. Adolph S. Ochs, and by the like unselfish efforts of the representatives of forty-five leading organizations of intellectual activity and of the nearly two hundred authors who—often at considerable sacrifice—have prepared the surveys of the fields of learning and experience.

This issue of THE AMERICAN YEAR BOOK is the fourth of the present series, which followed the first series covering the period 1910-1919 inclusive. The volume covering the year 1928 is published in uniform type page, so that it may conform to the earlier issues and thus make a uniform set as published year by year.

In every case, either through the organization represented, or through the personal knowledge of the editor, writers of acknowledged authority are invited to epitomize the progress for the year in their respective fields. This united service to the public, to authors, writers, men of science, and editors, is rendered with the sincere wish of the representatives of the forty-five learned societies that it may prove a stimulus to further investigation and study, as well as a concise, coördinated and dependable record of current American achievement.

With THE AMERICAN YEAR BOOK serving as a key to information within its scope, and *The New York Times Index* as a source of references to more detailed accounts, the reader is effectively and expeditiously placed in possession of the facts relating to his inquiry. Along with the growing prosperity of the nation has come a general recognition of the contribution which research makes to that desirable economic condition, and this has afforded a corresponding encouragement to all concerned in the preparation of THE AMERICAN YEAR BOOK.

For the convenience of the users, the text is preceded by a list of the learned societies and their representatives and a list of the contributors, which lists include men and women of established reputation in their field. At the end of each Division is added a brief list of Cognate Societies with their addresses, so that the searcher may know to whom to apply for further information on a given subject. This will be an aid appreciated not only by specialists but by those engaged in research in any subject and by students in school and college who desire additional information.

TABLE OF CONTENTS

PAGE

PREFACE v

CONSTITUENT SOCIETIES AND SUPERVISORY BOARD xiii

CONTRIBUTORS xvii

PART ONE: HISTORICAL

DIVISION

I. AMERICAN POLITICAL HISTORY 1

The Presidential Election of 1928.—Congress and Legislative Investigations.—Significant Federal Legislation.—The President and His Policies.—Federal Administrative Commissions.—National Statesmen.—The Prohibition Controversy.—State and Local Elections of 1928.—Statistics of State and Local Elections of 1928.—Cognate Societies.

II. INTERNATIONAL RELATIONS AFFECTING THE UNITED STATES . 45

The United States Foreign Service.—Treaties Completed and Ratified.—The Influence of the United States in World Affairs.—Latin-American Relations.—Oriental and Near Eastern Relations of the United States.—International Conferences.—America's Relations to the League of Nations and the World Court.—The Institute of Politics.—The Institute of Pacific Relations.—Cognate Societies.

PART TWO: AMERICAN GOVERNMENT

III. NATIONAL GOVERNMENT 82

Personnel Analysis of the Seventieth Congress.—Members of the Senate and House.—Federal Administrative Service.—Federal Civil Service.—Personnel of the Judiciary.—Federal Judicial Prosecutions.—The Supreme Court and Constitutional Law.—Cognate Societies.

IV. STATE GOVERNMENT 117

National and Interstate Relations of States.—State Constitutions, Referenda and Initiatives.—Changes in Electoral Laws.—State Legislatures and Legislation.—State Executives and Departments.—State Judiciaries and State Administrations.—County and Rural Government.—Cognate Societies.

DIVISION PAGE

V. Municipal Government 128

City Politics.—Administration and Research.—City Manager Government.—Metropolitan and Regional Planning.—Zoning.—City Planning.—Fire Prevention and Municipal Miscellanies.—Cognate Societies.

VI. Territories and Spheres of Influence 146

Alaska and Hawaii.—Porto Rico.—The District of Columbia.—The Philippine Islands.—The Virgin Islands, Guam and American Samoa.—Maritime Juridiction.—Spheres of American Influence.

PART THREE: GOVERNMENTAL FUNCTIONS

VII. Public Finance and Taxation 168

National Financial Resources and Expenditures.—The National Budget.—The National Debt and Allied Debts to the United States.—State Revenues, Expenditures and Budgets.—City Finance.—Tax Legislation.—Land and Property Taxes.—The Income Taxes.—Corporation and Bank Taxes.—Inheritance Taxes.—Automobile and License Taxes.—Cognate Societies.

VIII. Public Resources and Utilities 211

Federal Surveys and Maps.—State Geological Surveys.—Reclamation and Irrigation.—Public Lands.—Land Titles and Restrictions.—Public Service Commissions.—Municipal Ownership.—Street Traffic and Regulation.—Waterways and Harbors. (See also Division IX).—Water Supply.—Electric Lighting and Power.—Cognate Societies.

IX. Defense and Armaments 255

Military Problems of the United States.—Military Education.—Military and Naval Pensions.—The United States Veterans' Bureau.—Organization of the Army.—Accomplishments of Army Personnel.—Waterways and Harbors (See also Division VIII).—Organization of the Navy.—Functions of the Navy.—Naval Construction and Equipment.—Naval Aeronautics.—Naval Education.—Cognate Societies.

PART FOUR: ECONOMICS AND BUSINESS

X. Business and Finance 307

General Business Conditions.—The Security and Money Markets.—Installment Selling.—Banking Transactions.—Foreign Trade.—Railroad Traffic and Earnings.—Control of Production.—Control of Foreign Trade.—Public Control of Futures Trading.—Protection of Securities.—National and State Banks.—Federal Reserve System.—Other Banks and Trust Companies.—Foreign Exchange.—Life Insurance.—Fire Insurance.—Marine Insurance.—Casualty Insurance.—Cognate Societies.

TABLE OF CONTENTS

DIVISION PAGE

XI. Agriculture and Allied Industries 369

Conditions of Agriculture.—Agricultural Legislation.—Grain and Cotton Crops.—Livestock and Meat Products.—Dairying.—Diseases and Pests of Animals.—Diseases of Plants.—Insect Pests.—Marketing.—Fisheries.—Cognate Societies.

XII. Mineral Industries 397

Mining and Ore Dressing.—Coal and Coke.—Petroleum.—Copper.—Gold and Silver.—Iron and Steel.—Zinc.—Lead.—Cognate Societies.

XIII. Manufactures and Transportation 418

General Conditions in Manufacturing.—Administration of the Tariff.—United States Tariff Commission.—Imports and Exports.—Conditions of Internal Commerce.—Railroads.—Highways and Motor Roads.—Motor Bus Service.—Urban and Inter-Urban Railways.—Merchant Mariné.—The Airship and Airplane Technique.—Radio.—Manufacturing Statistics.—Cognate Societies.

PART FIVE: SOCIAL CONDITIONS AND AIMS

XIV. Immigration, Races and Population 469

Race Conditions in the United States.—Immigration Problems.—The Quota System.—Citizenship and Naturalization.—Population Statistics.—Cognate Societies.

XV. Social Problems and Conditions 488

Crime Conditions in the United States.—Penal Conditions and Prison Labor.—Preventive Work in Delinquency.—Organized Social Work.—Social Hygiene.—Mental Hygiene.—Housing Problems.—Child Welfare.—Child Labor.—Socialism.—Cognate Societies.

XVI. Labor and Labor Legislation 521

Conditions of Labor and Labor Organizations.—Labor in Politics.—Labor Legislation.—Employment.—Labor Mediation, Strikes and Lockouts.—Workmen's Compensation and Insurance.—Cognate Societies.

XVII. Religion and Religious Organizations 540

Interdenominational Conferences and Activities.—Church and Government Relations.—Protestant Denominational Activities.—Roman Catholic Church.—Judaism and Jewish Communal Affairs.—Cognate Societies.

PART SIX: SCIENCE—PRINCIPLES AND APPLICATION

XVIII. Mathematics and Astronomy 566

Mathematical Research and Analysis.—Geometry.—History of Mathematics.—Mathematical Physics.—Mathe-

DIVISION PAGE

matical Meetings.—Astronomy.—The New Greatest Telescope.—Astronomical Observations.—Solar Eclipses.—Comets.—Meteors.—Star Arrangements.—Cognate Societies.

XIX. Engineering and Construction 580

Structural Engineering.—Mechanical Engineering.—Electrical Engineering.—Automotive Engineering.—Naval Architecture and Marine Engineering.—Commercial Marine Engineering.—Materials of Engineering and Construction.—Industrial Standardization.—Commercial Aviation.—American Machinery Industry.—Cognate Societies.

XX. Geophysical Sciences 650

Dynamic and Structural Geology.—Earthquakes and Volcanoes.—Economic Geology.—Mineralogy and Petrography.—Meteorology.—Terrestrial Magnetism.—Economic Geography. — Cartography. — American Explorations. — Cognate Societies.

XXI. Chemistry and Physics 676

Inorganic and Physical Chemistry.—Organic Chemistry.—Agricultural Chemistry.—Electrochemistry.—Industrial Chemistry and Chemical Engineering.—Physics.—Cognate Societies.

XXII. Biological Sciences 699

Organic Evolution.—Vertebrate Zoology.—Invertebrate Zoology.—Vertebrate Paleontology.—Botany.—Economic Botany.—Entomology.—Cognate Societies.

XXIII. Medical Sciences 723

Physiology. — Pathology. — Medicine. — Pharmacology. — Surgery.—Dentistry.—Public Health and Hygiene.—Vital Statistics.—Cognate Societies.

XXIV. Philosophical and Social Sciences 746

Philosophy.—Psychology.—Sociology.—Anthropology and Ethnology.—Mental Tests and Measurements.—Cognate Societies.

PART SEVEN: THE HUMANITIES

XXV. Literature and Language 769

Biography, History and Travel.—American Fiction.—American Poetry.—Belles Lettres and Criticism.—English Language and Literature.—Germanic Languages and Literature.—Romance Languages and Literature.—Latin Literature.—Greek Literature.—Semitic Languages and Literature.—Libraries.—Cognate Societies.

TABLE OF CONTENTS

DIVISION		PAGE
XXVI.	THE ARTS	804
	Archaeological Discovery.—Painting.—Sculpture.—Architecture.—Music and Opera.—The Theater.—Moving Pictures.—Cognate Societies.	
XXVII.	EDUCATION	834
	Elementary Education.—Secondary Education.—Collegiate Education.—Professional Education.—Vocational Education.—Adult Education.—Pure Research in Educational Institutions.—Educational Miscellanies.—Cognate Societies.	
INDEX		873

CONSTITUENT SOCIETIES AND SUPERVISORY BOARD

SOCIETIES AND REPRESENTATIVES

1. **ACADEMY OF POLITICAL SCIENCE IN THE CITY OF NEW YORK.**
   GEORGE W. OCHS OAKES, *New York Times.*

2. **ACTUARIAL SOCIETY OF AMERICA.**
   WENDELL M. STRONG, 32 Nassau Street, New York.

3. **AMERICAN ACADEMY OF POLITICAL AND SOCIAL SCIENCE.**
   DR. ERNEST M. PATTERSON, University of Pennsylvania, Philadelphia.

4. **AMERICAN ANTHROPOLOGICAL ASSOCIATION.**
   PROF. GEORGE GRANT MACCURDY, Yale University, New Haven.

5. **AMERICAN ANTIQUARIAN SOCIETY.**
   WALDO LINCOLN, Worcester, Massachusetts.

6. **AMERICAN ASSOCIATION OF ECONOMIC ENTOMOLOGISTS.**
   E. PORTER FELT, Chief Entomologist, Bartlett Tree Research Laboratories.

7. **AMERICAN ASSOCIATION OF MUSEUMS.**
   CHARLES R. RICHARDS, General Education Board, New York.

8. **AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.**
   PROF. EDWARD G. CONKLIN, Princeton University, Princeton.

9. **AMERICAN ASSOCIATION FOR LABOR LEGISLATION.**
   PROF. HENRY W. FARNAM, Yale University, New Haven.

10. **AMERICAN ASTRONOMICAL SOCIETY.**
    PROF. HENRY N. RUSSELL, Princeton University, Princeton.

11. **AMERICAN BAR ASSOCIATION.**
    ASSOCIATE JUSTICE HARLAN F. STONE, Washington.

12. **AMERICAN CHEMICAL SOCIETY.**
    COL. MARSTON T. BOGERT, 422 W. 154th Street, New York.

13. **AMERICAN ECONOMIC ASSOCIATION.**
    PROF. EDWIN R. A. SELIGMAN, Columbia University, New York.

14. **AMERICAN FEDERATION OF ARTS.**
    HERBERT ADAMS, 131 W. 11th Street, New York.

15. **AMERICAN HISTORICAL ASSOCIATION.**
    PROF. ALBERT BUSHNELL HART, Harvard University, Cambridge.

16. **AMERICAN INSTITUTE OF ARCHITECTS.**
Frank C. Baldwin, 1741 New York Avenue, Washington, D. C.

17. **AMERICAN INSTITUTE OF CRIMINAL LAW.**
Dr. George W. Kirchwey, 105 E. 22nd Street, New York.

18. **AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS.**
Henry H. Henline, 33 West 39th St., New York.

19. **AMERICAN INSTITUTE OF MINING ENGINEERS.**
Prof. Bradley Stoughton, Lehigh University, Bethlehem, Pa.

20. **AMERICAN INSTITUTE OF RADIO ENGINEERS.**
Dr. A. M. Goldsmith, Radio Corporation of America, New York.

21. **AMERICAN LIBRARY ASSOCIATION.**
James I. Wyer, State Librarian, Albany, New York.

22. **AMERICAN MATHEMATICAL SOCIETY.**
Prof. Tomlinson Fort, Lehigh University, Bethlehem, Pa.

23. **AMERICAN MEDICAL ASSOCIATION.**
Dr. Alexander Lambert, 43 E. 72nd Street, New York.

24. **AMERICAN ORIENTAL SOCIETY.**
Prof. A. V. Williams Jackson, Columbia University, New York.

25. **AMERICAN PALEONTOLOGICAL SOCIETY.**
Dr. William D. Mathew, American Museum of Natural History, New York.

26. **AMERICAN PHILOLOGICAL ASSOCIATION.**
Dr. John C. Rolfe, University of Pennsylvania, Philadelphia.

27. **AMERICAN PHYSICAL SOCIETY.**
Prof. Edward L. Nichols, Cornell University, Ithaca, N. Y.

28. **AMERICAN POLITICAL SCIENCE ASSOCIATION.**
Prof. W. W. Willoughby, Johns Hopkins University, Baltimore.

29. **AMERICAN PUBLIC HEALTH ASSOCIATION.**
Dr. Milton J. Rosenau, 65 Naples Road, Brookline, Massachusetts.

30. **AMERICAN SOCIETY OF INTERNATIONAL LAW.**
Prof. George G. Wilson, Harvard University, Cambridge.

31. **AMERICAN SOCIETY OF MECHANICAL ENGINEERS.**
Calvin W. Rice, 29 W. 39th Street, New York.

32. **AMERICAN SOCIETY FOR TESTING MATERIALS.**
F. M. Farmer, East End Avenue & 80th Street, New York.

33. **AMERICAN SOCIOLOGICAL SOCIETY.**
Prof. Frank H. Hankins, Smith College, Northampton, Mass.

34. **AMERICAN STATISTICAL ASSOCIATION.**
Edwin I. Kopf, Metropolitan Life Insurance Co., 1 Madison Ave., New York.

35. **ARCHAEOLOGICAL INSTITUTE OF AMERICA.**
PROF. RALPH VAN DEMAN MAGOFFIN, New York University, New York.

36. **BOTANICAL SOCIETY OF AMERICA.**
DR. GEORGE T. MOORE, Missouri Botanical Garden, St. Louis, Mo.

37. **GENERAL FEDERATION OF WOMEN'S CLUBS.**

38. **GEOLOGICAL SOCIETY OF AMERICA.**
PROF. WILLIAM M. DAVIS, Harvard University, Cambridge, Mass.

39. **NATIONAL AERONAUTIC ASSOCIATION.**
GODFREY L. CABOT, 16 Highland Street, Cambridge, Mass.

40. **NATIONAL CONFERENCE OF SOCIAL WORK.**
DR. HASTINGS HORNELL HART, Russell Sage Foundation, New York.

41. **NATIONAL EDUCATION ASSOCIATION.**
CHANCELLOR ELMER E. BROWN, New York University, New York.

42. **NATIONAL GEOGRAPHIC SOCIETY.**
DR. GILBERT GROSVENOR, National Geographic Society, Washington.

43. **NATIONAL MUNICIPAL LEAGUE.**
CLINTON ROGERS WOODRUFF, North American Building, Philadelphia.

44. **NATIONAL SOCIETY OF VOCATIONAL EDUCATION.**
L. H. DENNIS, State Director of Vocational Education, Harrisburg, Pa.

45. **THE SOCIETY OF NAVAL ARCHITECTS AND MARINE ENGINEERS.**
CAPT. W. M. MCFARLAND, 85 Liberty Street, New York.

CONTRIBUTORS

Thomas Adams: METROPOLITAN AND REGIONAL PLANNING.
General Director of Plans and Surveys, Regional Plan of New York.

P. G. Agnew, B.L., A.M., Ph.D.: INDUSTRIAL STANDARDIZATION.
Secretary, American Engineering Standards Committee.

R. H. Aishton: RAILROADS.
President, American Railway Association.

Carroll S. Alden, B.A., Ph.D.: NAVAL EDUCATION.
Head of the Department of English, United States Naval Academy.

B. R. Alexander: NAVAL ARCHITECTURE AND ENGINEERING.
Lieutenant Commander, U. S. N.; Bureau of Engineering, Navy Department.

Charles R. Allen: VOCATIONAL EDUCATION.
Editor and Educational Consultant, Federal Board of Vocational Education.

Irene Osgood Andrews, A.B.: LABOR LEGISLATION.
Associate Secretary, American Association for Labor Legislation.

John B. Andrews, A.B., A.M., Ph.D.: EMPLOYMENT AND WORKMEN'S COMPENSATION.
Secretary, American Association for Labor Legislation.

J. Brooks Atkinson: THE THEATER.
Dramatic Critic, *The New York Times.*

Leonard S. Austin: COPPER.
Mining Engineer, Los Angeles, California.

Beulah Bailey: TAX LEGISLATION.
Librarian, New York State Department of Taxation and Finance.

Catherine Smith Bailey: MUSIC AND OPERA.
Music Department, *The Christian Science Monitor.*

Peter Bain: MERCHANT MARINE; NAVAL CONSTRUCTION.
Editor, *Shipping Illustrated, Bain's Marine Annual.*

Harland Bartholomew: CITY PLANNING.
Harland Bartholomew and Associates, St. Louis, Mo.

George A. Barton, A.B., A.M., Ph.D., LL.D.: SEMITIC LANGUAGES AND LITERATURE.
Professor of Semitic Languages, University of Pennsylvania.

John Bauer, Ph.D.: PUBLIC SERVICE COMMISSIONS.
American Public Utilities Bureau, New York.

Albert Croll Baugh, Ph.D.: ENGLISH LANGUAGE AND LITERATURE.
Professor of English, University of Pennsylvania.

LaVerne Beales: MANUFACTURING STATISTICS.
Chief Statistician for Manufactures, Bureau of the Census, Department of Commerce.

Archibald Black: COMMERCIAL AERONAUTICS.
Consulting Aeronautical Engineer; Member, Society of Automotive Engineers, Aero Chamber of Commerce, National Aeronautic Association.

Henry W. Blake: Ph.D.: URBAN AND INTERURBAN RAILWAYS.
Senior Editor: *Electric Railway Journal;* Member, American Institute of Electrical Engineers, American Electric Railway Association.

J. Grist Brainerd: ELECTRICAL ENGINEERING.
Moore School of Electrical Engineering, University of Pennsylvania.

William Stanley Braithwaite, Litt.D.hon. A.M.: AMERICAN POETRY.
Editor, author and compiler.

Hugh A. Brown, Ph.D.: RECLAMATION AND IRRIGATION.
Director of Reclamation, Bureau of Reclamation, Department of the Interior.

Robert M. Brown, Ph.D.: AMERICAN EXPLORATION.
Professor, Department of Geology and Geography, Rhode Island College of Education.

C. A. Browne, B.A., M.A., Ph.D.: AGRICULTURAL CHEMISTRY.
Chief of Chemical and Technical Research, U. S. Department of Agriculture.

Friedrich Bruns, Ph.D.: GERMANIC LANGUAGES AND LITERATURE.
Assistant Professor of German, University of Wisconsin.

Arthur E. Buck: NATIONAL BUDGET.
Bureau of Municipal Research, New York.

Raymond L. Buell: INTERNATIONAL CONFERENCES.
Research Director, Foreign Policy Association.

Ada L. Bush: CONDITIONS OF INTERNAL COMMERCE.
Director, Special Inquiry Service for Domestic Trading, Bureau of Foreign and Domestic Commerce, U. S. Department of Commerce.

Harold S. Buttenheim: ZONING.
Editor, *The American City.*

Allison Butts, A.B., B.S.: LEAD.
Assistant Professor of Metallurgy at Lehigh University. Associate Editor: *The Mineral Industry.*

W. F. Callander, Ph.D.: GRAIN AND COTTON PRODUCTS.
Chairman, Crop Reporting Board, Bureau of Agricultural Economics, U. S. Department of Agriculture.

Leon Cammen, M.A.: MECHANICAL ENGINEERING.
Associate Editor, *Mechanical Engineering.*

Ernest W. Camp: TARIFF ADMINISTRATION.
Director of Customs, Division of Customs, U. S. Treasury Department.

H. K. Carroll, LL.D.: RELIGION AND RELIGIOUS ORGANIZATIONS.
Secretary, Ecumenical Methodist Conference, Corresponding Secretary, Francis Asbury Memorial Association.

C. C. Carstens: CHILD WELFARE.
Executive Director, Child Welfare League of America.

Henry Chalmers, A.B., A.M.: INTERNATIONAL TRADE CONTROL.
Chief, Division Foreign Tariffs, Department of Commerce, Member, American Economic Association, American Academy of Political and Social Science.

Lindley D. Clark, A.B., A.M., LL.B., LL.M.: LABOR IN POLITICS.
Deputy Commissioner, U. S. Employees Compensation Commission; Member; American Association for Labor Legislation.

H. Burdett Cleveland: WATER SUPPLY.
Consulting Sanitary Engineer, New York.

Edwin F. Cone: IRON AND STEEL.
Associate Editor: *The Iron Age.*

Milton Conover, Ph.D.: PERSONNEL OF THE SEVENTIETH CONGRESS.
Professor of Economics, Yale University.

Arthur E. Cook, LL.B.: IMMIGRATION.
Assistant to the Secretary, U. S. Department of Labor.

Douglas F. Cox: MARINE INSURANCE.
President, United States Merchants' and Shippers' Insurance Company, New York.

Philip W. L. Cox, A.B., A.M., Ph.D.: SECONDARY EDUCATION.
School of Education, New York University.

Nelson Antrim Crawford, B.A., M.A.: AGRICULTURAL LEGISLATION.
Director of Information, Bureau of Publications, U. S. Department of Agriculture.

Raymond F. Crist, LL.B.: CITIZENSHIP AND NATURALIZATION.
Commissioner of Naturalization, U. S. Department of Labor.

Harry F. Cunningham: ARCHITECTURE.
Architect, New York, Member, American Institute of Architects.

Karl K. Darrow: PHYSICS.
Bell Telephone Technical Laboratories, New York.

Herbert H. Davis, M.D.: SURGERY.
Director of Laboratory of Experimental Surgery, University of Nebraska, College of Medicine.

William H. Davis, A.B., M.D.: VITAL STATISTICS.
Chief Statistician for Vital Statistics, Bureau of the Census, Department of Commerce.

J. H. Dellinger, A.B., Ph.D.: RADIO.
Chief of Radio Laboratory, United States Bureau of Standards, Past President, The Institute of Radio Engineers.

Theodore A. Distler: COLLEGIATE EDUCATION.
Director on Admissions and Personnel, New York University.

F. Lowell Dunn, B.S., M.D.: MEDICINE.
Assistant Professor, University of Nebraska School of Medicine.

William B. Dunning, D.D.S., F.A.C.D.: DENTISTRY.
Professor of Dentistry, Columbia University.

Gurden Edwards: BANKS AND BANKING.
Director, Public Relations Commission, American Bankers Association.

W. Elmer Ekblaw, B.Sc.: ECONOMIC GEOLOGY AND GEOGRAPHY.
Assistant Editor, *Economic Geography*, Clark University.

A. R. Elsasser, A.M., Ph.D.: AMERICAN FICTION.
Assistant Professor of English, Princeton University.

Mary L. Ely: ADULT EDUCATION.
Publications Editor, American Association for Edult Education.

Ray H. Everett, A.B., LL.B.: SOCIAL HYGIENE.
Director, Department of Public Information, American Social Hygiene Association; Managing Editor, *Journal of Social Hygiene.*

Douglas P. Falconer: PREVENTIVE WORK IN DELINQUENCY.
Executive Secretary, Children's Aid Society, Buffalo.

E. Porter Felt, D.Sc.: ENTOMOLOGY.
Chief Entomologist, Bartlett Tree Research Laboratories, Stamford, Conn. Member; American Association of Economic Entomologists.

Thomas E. Finegan: EDUCATIONAL MISCELLANIES.
Eastman Teaching Films, Incorporated, Rochester.

Colin G. Fink, B.A., M.A., Ph.D.: ELECTROCHEMISTRY.
Professor, Department of Chemical Engineering, Columbia University. Secretary, American Electrochemical Society. Member: National Research Council, American Institute of Mining and Metallurgical Engineers.

Irving Fisher, A.B., Ph.D.: PROHIBITION.
Professor of Political Economy, Yale University.

Ralph Flint: SCULPTURE.
Art Critic, *The Christian Science Monitor.*

Tomlinson Fort, A.B., A.M., Ph.D.: MATHEMATICS.
Professor of Mathematics, Lehigh University.

W. R. Furlong: VIRGIN ISLANDS, GUAM, AND AMERICAN SAMOA.
Captain U. S. N., Office of Naval Intelligence, Navy Department.

William Addleman Ganoe, A.B., A.M.: MILITARY AFFAIRS.
Major, U. S. A., Historical Section, Army War College.

Harry Gold, M.D.: PHARMACOLOGY.
Department of Pharmacology, Cornell University Medical School.

E. A. Goldenweiser: FEDERAL RESERVE SYSTEM.
Director of Research and Statistics, Federal Reserve Board.

Ernest P. Goodrich, B.Pd., B.Sc.: STREET TRAFFIC AND REGULATION.
Consulting Engineer, Russell Sage Foundation.

George Gove: HOUSING PROBLEMS.
Secretary, State Housing Board, New York.

J. M. Greenman, B.S., M.S., Ph.D.: BOTANY.
Professor of Botany, Washington University; Curator Herbarium, Missouri Botanical Garden, St. Louis.

Frederic H. Guild: STATE CONSTITUTIONS.
Professor of Political Science, University of Kansas.

Mordaunt Hall: MOVING PICTURES.
Moving Picture Critic, *The New York Times.*

R. Dawson Hall: COAL AND COKE.
Engineering Editor: *The Coal Age.*

R. O. Hall: IMPORTS AND EXPORTS.
Assistant Chief, Bureau of Foreign and Domestic Commerce, Department of Commerce.

George L. Hamilton, A.B., A.M., Ph.D.: ROMANCE LANGUAGES AND LITERATURE.
Professor of Romance Languages and Literature, Cornell University.

Frank H. Hankins, A.B., Ph.D.: SOCIOLOGY AND SOCIAL SCIENCES.
Professor of Sociology at Smith College. Member; Sociological Society, Academy of Political Science, Sociological Society of London.

Edward R. Hardy: FIRE INSURANCE.
Assistant Manager, New York Fire Insurance Exchange.

Albert Bushnell Hart, LL.D.: THE PRESIDENTIAL ELECTION.
Emeritus Professor of Government, Harvard University.

James Hart, Ph.D.: THE PRESIDENT AND NATIONAL STATESMEN.
Associate in Political Science, Johns Hopkins University.

R. J. Haskell, Ph.D.: PLANT DISEASES.
Pathologist in Charge, Plant Disease Survey, Bureau of Plant Industry, U. S. Department of Agriculture.

H. K. Hayes: ECONOMIC BOTANY.
Chief of Division of Agronomy and Plant Genetics, University of Minnesota.

Daniel L. Hazard, A.B.: TERRESTRIAL MAGNETISM.
Assistant Chief, Division of Terrestrial Magnetism and Seismology, United States Coast and Geodetic Survey.

Charles W. Henderson: GOLD AND SILVER.
Engineer in Charge, Denver Section Mineral Statistics, U. S. Bureau of Mines.

Frances M. Henderson: PAINTING.
American Federation of Arts.

Charles E. Hill, A.B., A.M., Ph.D.: MARITIME JURISDICTION.
Professor of Political Science, George Washington University.

Frank T. Hines, LL.D.: VETERANS.
Brigadier General, O.R.C.; Director, U. S. Veterans Bureau

Thomas N. Hoover: ELECTION STATISTICS.
Professor of History, Ohio University.

O. C. Hormell: COUNTY AND RURAL GOVERNMENT.
De Alba Stamwood Alexander Professor of Government, Bowdoin College.

Robert C. Horn, A.B., A.M., Ph.D., Litt.D.: GREEK LITERATURE.
Professor of Greek, Muhlenberg College; Lecturer in Greek, University of Pennsylvania; Member, American Philological Association.

James F. Hosic: ELEMENTARY EDUCATION.
Teachers College, Columbia University.

Solomon S. Huebner, B.S., M.S., Ph.D.: ECONOMIC AND BUSINESS CONDITIONS.
Professor of Insurance and Commerce, University of Pennsylvania. Associate Editor, *Annals of American Academy of Political and Social Science.* Member; American Institute of Banking.

Wilbur S. Hulin: PSYCHOLOGY.
Instructor, Department of Psychology, Princeton University.

Harry E. Hull: THE QUOTA SYSTEM.
Commissioner, General of Immigration, U. S. Department of Labor.

Merlin H. Hunter, Ph.D.: NATIONAL FINANCE.
Associate Professor of Economics, University of Illinois

Charles D. Hurd: ORGANIC CHEMISTRY.
Secretary, Department of Chemistry, Northwestern University.

J. A. Hyslop, B.S., M.S.: PLANT PESTS.
Entomologist in charge, Insect Pest Survey, Bureau of Entomology, U. S. Department of Agriculture.

W. R. Ingalls, S.B., E.D.: ZINC.
Consulting Engineer, New York. Member; American Institute of Mining and Metallurgical Engineers.

Edgar Jadwin: WATERWAYS AND HARBORS.
Major General, U. S. A., Chief of Engineers, War Department.

A. H. Jansson: COMMERCIAL MARINE ENGINEERING.
Editor, *Marine Review*, Cleveland.

William M. Jardine, B.Sc., LL.D.: AGRICULTURE.
U. S. Secretary of Agriculture; Fellow, American Association for the Advancement of Science. Member; Executive Board, National Research Council. Advisory Council. Agricultural Commission of the American Bankers Association.

Jens P. Jensen, Ph.D.: TAXATION.
Professor of Economics, University of Kansas.

W. L. G. Jeorg: CARTOGRAPHY.
Editor, *Research Series*, American Geographical Society. Member; Division of Geology and Geography, National Research Council.

Ernest L. Jones, A.M.: THE AIRSHIP AND AIRPLANE TECHNIQUE.
Director of Aeronautics, U. S. Department of Commerce.

John B. Kelly: ROMAN CATHOLIC CHURCH.
Spiritual Director of the Catholic Writers' Guild of America, Inc.

Fred. I. Kent: FOREIGN EXCHANGE.
Director, Bankers Trust Company.

Milo Smith Ketchum, B.S.: STRUCTURAL ENGINEERING.
Dean, College of Engineering, University of Illinois.

Charles Kettleborough: ELECTORAL LAWS.
Director, Indiana Legislative Bureau.

James E. Kindred, Ph.D.: VERTEBRATE ZOOLOGY.
Associate Professor of Histology and Embryology, University of Virginia.

S. D. Kirkpatrick: INDUSTRIAL CHEMISTRY AND CHEMICAL ENGINEERING.
Editor, *Chemical and Metallurgical Engineering*, New York.

Howard R. Knight: ORGANIZED SOCIAL WORK.
General Secretary, National Conference of Social Work.

Roland L. Kramer: FOREIGN TRADE.
Professor, Wharton School of Finance and Commerce, University of Pennsylvania.

Walter C. Langsam, B.S., A.M.: FEDERAL PROSECUTIONS.
Department of History, Columbia University.

Harry H. Laughlin, B.S., M.S., Sc.D.: RACE CONDITIONS.
Assistant Director, Department of Genetics, Carnegie Institute.

Algernon Lee: SOCIALISM.
Educational Director, Rand School of Social Science: Editor, *The New Leader.*

M. M. Leighton: STATE GEOLOGICAL AND GEOGRAPHICAL SURVEYS.
Chief, Illinois State Geological Secretary, Association Survey of American State Geologists.

S. F. Light: INVERTEBRATE ZOOLOGY.
Professor of Zoology, University of California.

Ernest R. Lilley: PETROLEUM.
Associate Professor of Geology, New York University.

Clarence Linton: EDUCATIONAL MISCELLANIES.
Secretary, Teachers College, Columbia University.

Charles E. Locke, S.B.: MINING AND ORE DRESSING.
Professor of Mining Engineering at Massachusetts Institute of Technology. Member; American Institute of Mining Engineers.

F. B. Loomis, B.A., Ph.D.: VERTEBRATE PALEONTOLOGY.
Professor of Geology, Amherst College.

Robert A. Love: INSTALLMENT SELLING.
Department of Economics, The College of the City of New York.

Albert H. Lybyer, A.B., A.M., Ph.D.: ORIENTAL AND NEAR EASTERN RELATIONS.
Professor of History, University of Illinois.

A. H. MacCormick: PENAL CONDITIONS.
National Society of Penal Information, New York.

Thomas H. MacDonald, B.C.D.: HIGHWAYS AND MOTOR ROADS.
Chief, Bureau of Public Roads, U. S. Department of Agriculture.

Arthur W. Macmahon: CONGRESS AND LEGISLATION.
Associate Professor of Government, Department of Public Law, Columbia University.

Ralph V. D. Magoffin, A.B., Ph.D., LL.D.: ARCHAEOLOGY.
President, Archaeological Institute of America, New York University. Member; American Historical Association, American Philological Association.

Roy Malcom, A.M., Ph.D.: SPHERES OF AMERICAN INFLUENCE.
Professor of Political Science, University of Southern California.

Lawrence B. Mann: MANUFACTURES.
Acting Chief, Division of Statistical Research, Bureau of Foreign and Domestic Commerce, U. S. Department of Commerce.

Arthur Richmond Marsh, A.B.: PUBLIC CONTROL OF FUTURES TRADING.
Member; New York Cotton Exchange; President and Treasurer, The Chronicle Company.

Thomas O. Marvin, B.D.: THE TARIFF.
Chairman U. S. Tariff Commission.

Kirtley F. Mather, B.Sc., Ph.D.: EARTHQUAKES.
Associate Professor of Physiography and Chairman of Department of Geology and Geography, Harvard University; Geologist, U. S. Geological Survey; Fellow, Royal Geographical Society.

John M. Mathews, A.B., Ph.D.: STATE GOVERNMENT AND INTERNATIONAL AFFAIRS.
Professor of Political Science, University of Illinois, Member; American Political Science Association, American Society of International Law.

Howard Lee McBain, B.A., M.A., Ph.D.: SUPREME COURT DECISIONS.
Eaton Professor of the Science of Government, Columbia University. Associate Editor, *National Municipal Review* and *Political Science Quarterly.*

Frank McIntyre: TERRITORIES AND DEPENDENCIES.
Major General, U. S. A.; Chief, Bureau of Insular Affairs, U. S. War Department.

A. W. McKay: MARKETING.
Marketing Economist, Bureau of Agricultural Economics, U. S. Department of Agriculture.

Walter W. McLaren, M.A., Ph.D.: INSTITUTE OF POLITICS.
Brough Professor of Economics, Williams College; Executive Secretary, Institute of Politics.

Bennet Mead: CRIME CONDITIONS.
Specialist in Social Statistics. Bureau of the Census, U. S. Department of Commerce.

A. J. Miller, M.D.: PATHOLOGY.
Professor of Pathology and Bacteriology, University of Louisville.

W. A. Moffett: NAVAL AERONAUTICS.
Rear Admiral, U. S. N.; Chief, Bureau of Aeronautics, U. S. Navy Department.

John R. Mohler, V.M.D., D.Sc.: DISEASES AND PESTS OF ANIMALS.
Chief, Bureau of Animal Industry, U. S. Department of Agriculture. Member; Society of American Bacteriologists, American Veterinary Medical Association.

Helen C. Monchow: LAND TITLES.
Research Assistant, Institute for Research in Land Economics and Public Utilities, Chicago.

Mabel Newcomer, Ph.D.: INCOME AND INHERITANCE TAXES.
Professor of Economics, Vassar College.

G. Kingsley Noble, Ph.D.: ORGANIC EVOLUTION.
Curator of Herpetology and Experimental Biology, The American Museum of Natural History.

William F. Notz, B.A., M.A., Ph.D.: CONTROL OF PRODUCTION.
Dean, School of Foreign Service, Georgetown University.

A. B. Nystrom: DAIRYING.
Bureau of Dairying, U. S. Department of Agriculture.

Johnson O'Connor: MENTAL TESTS AND MEASUREMENTS.
General Electric Company.

H. M. Olmsted: MUNICIPAL OWNERSHIP.
Associate Editor, *The American City.*

George K. Pratt, M.D.: MENTAL HYGIENE.
Assistant Medical Director, National Committee on Mental Hygiene.

Lewis Radcliffe: FISHERIES.
Deputy Commissioner, Bureau of Fisheries, U. S. Department of Commerce.

W. H. Rastall: AMERICAN MACHINERY.
Chief, Industrial Machinery, Division Bureau of Foreign and Domestic Commerce, U. S. Department of Commerce.

A. Duncan Reid: CASUALTY AND MISCELLANEOUS INSURANCE.
President: Globe Indemnity Company, Newark.

Calvin W. Rice, S.B., D.Eng.: MECHANICAL ENGINEERING.
Secretary, American Society of Mechanical Engineers; Fellow, American Institute of Electrical Engineers; Member; Institute of Electrical Engineers (London); Honorary Member, Koninklijk Instituut van Ingenieure.

Bernard G. Richards: JUDAISM.
Executive Secretary, American Jewish Congress.

A. A. Roback: PHILOSOPHY.
University Extension Lecturer, Commonwealth of Massachusetts.

William L. Rodgers: THE NAVY.
Rear Admiral, U. S. N.; Member, American Philosophical Society.

John C. Rolfe, A.B., A.M., Ph.D.: LATIN LITERATURE.
Professor of Latin Language and Literature, University of Pennsylvania. Member; American Philological Association.

Dorothy Rowden: LIBRARIES.
Editor, *Bulletin,* American Library Association.

A. M. Schlesinger, B.A., M.A.: AMERICAN HISTORICAL LITERATURE.
Professor of History, Harvard University; Fellow, Royal Historical Society (Great Britain); Member, American Association of University Professors.

Frederick L. Schuman: TREATIES COMPLETED AND RATIFIED.
Instructor, Department of Political Science, University of Chicago.

William M. Schuyler: NATIONAL GOVERNMENT.
Associate Editor, *The American Year Book.*

Winfield Scott: MILITARY AND NAVAL PENSIONS.
Commissioner, Bureau of Pensions, U. S. Department of the Interior.

William R. Shands: PROTECTION OF SECURITIES.
Director, Securities Division, Virginia State Corporation Commission.

E. W. Sheets, B.Sc., M.S.: LIVESTOCK.
Chief, Animal Husbandry Division, Bureau of Animal Industry, U. S. Department of Agriculture.

P. K. Sheldon: WATERWAYS AND HARBORS.
Associate Editor, *Port and Terminal.*

Lloyd M. Short: FEDERAL ADMINISTRATIVE COMMISSIONS.
Associate Professor of Political Science, University of Missouri.

Francis H. Sisson, A.B., LL.D.: NATIONAL AND ALLIED DEBTS.
Vice President, Guaranty Trust Company of New York; Member, American Economic Association, Academy of Political Science in the City of New York.

Bancroft Walker Sitterly, A.B., A.M., Ph.D.: ASTRONOMY.
Assistant Professor of Astronomy, Wesleyan University. Member; American Astronomical Society, American Association for the Advancement of Science; Fellow, Royal Astronomical Society.

William Spry: PUBLIC LANDS.
Commissioner, General Land Office, U. S. Department of the Interior.

Ethelbert Stewart: LABOR CONDITIONS.
Commissioner of Labor Statistics, U. S. Department of Labor.

Percy G. Stiles, M.D.: PHYSIOLOGY.
Professor of Physiology, Harvard University Medical School.

Carl W. Stocks: MOTOR BUS SERVICE.
Editor, *Bus Transportation,* New York.

Wendell M. Strong, Ph.D., B.A., M.A., LL.B.: LIFE INSURANCE.
Associate Actuary, Mutual Life Insurance Company, New York.

Graham H. Stuart, Ph.D.: LATIN-AMERICAN RELATION.
Professor of Political Science, Stanford University.

Ambrose L. Suhrie, A.M., Ph.D., LL.D.: PROFESSIONAL EDUCATION.
Professor, Teachers-College and Normal-School Education, New York University.

Arthur Sweetser, A.B., A.M.: LEAGUE OF NATIONS AND WORLD COURT.
Author. Member; Secretariat of the League of Nations.

Wiley H. Swift: CHILD LABOR.
Acting General Secretary, National Child Labor Committee, New York.

Hugh S. Taylor, Ph.D.: INORGANIC AND PHYSICAL CHEMISTRY.
Professor of Physical Chemistry, Princeton University.

Leon E. Truesdell: POPULATION STATISTICS.
Chief Statistician for Population, Bureau of the Census, U. S. Department of Commerce.

William N. Tyler: WATERWAYS AND HARBORS.
Associate Editor, *Port and Terminal.*

Burton M. Varney: METEOROLOGY.
Department of Meteorology, University of Southern California.

C. Laurence Warwick, B.Sc., C.E.: MATERIALS OF ENGINEERING.
Secretary-Treasurer, American Society for Testing Materials.

Warren Reed West: DISTRICT OF COLUMBIA.
Associate Professor of Political Science, George Washington University.

J. H. Wheat: FEDERAL SURVEYS AND MAPS.
Secretary, Federal Board of Surveys and Maps, U. S. Department of the Interior.

Herbert P. Whitlock, C.E.: MINERALOGY AND PETROGRAPHY.
Curator of Mineralogy, American Museum of Natural History.

Margaret de Forest Hicks Williams: THE UNITED STATES FOREIGN SERVICE.
Author and Specialist in International Affairs.

Elbert V. Wills, A.B., A.M., Ph.D.: EDUCATIONAL RESEARCH.
Editor-in-Chief, U. S. Navy Department, *Standard Stock Catalogue;* Member, American Historical Association.

George G. Wilson: PAN PACIFIC CONFERENCE.
Professor of International Law, Harvard University.

G. Lloyd Wilson: RAILROAD TRAFFIC.
Professor, Wharton School of Finance and Commerce, University of Pennsylvania.

C. E. A. Winslow, B.Sc., M.S., A.M.: PUBLIC HEALTH AND HYGIENE.
Professor of Public Health at Yale University; Member, American Public Health Association; Chairman: New York State Commission on Ventilation.

Clark Wissler, A.B., A.M., Ph.D.: ANTHROPOLOGY AND ETHNOLOGY.
Curator, American Museum of Natural History.

G. F. Wittig: ELECTRIC LIGHTING AND POWER.
Statistical Editor, *Electrical World.*

Austin M. Wolf: AUTOMOTIVE ENGINEERING.
Member, Society of Automotive Engineers.

Clinton Rogers Woodruff, A.B., LL.B., Ph.D.: CIVIL SERVICE; MUNICIPAL GOVERNMENT.

Member, Pennsylvania Bar; Honorary Secretary, National Municipal League; Editor, *National Municipal Review.*

THE AMERICAN YEAR BOOK

THE AMERICAN YEAR BOOK

A RECORD OF EVENTS AND PROGRESS

PART ONE
HISTORICAL

DIVISION I
AMERICAN POLITICAL HISTORY

THE PRESIDENTIAL ELECTION OF 1928

By Albert Bushnell Hart

Professor Emeritus of Government, Harvard University

PRE-ELECTION ACTIVITY

As in many previous elections, the campaign of 1928 began more than a year before the actual taking of the votes. The searchlight of publicity was directed on possible candidates; and first of all upon the nominees or near nominees of 1928. Then came to the front such questions as agricultural relief; the relation of the United States to large corporations deriving part of their business from government appropriations or from land and other privileges conferred by government; the attitude of the United States toward foreign relations and organizations; and particularly the enforcement of the Prohibition Laws.

From the Republican point of view the one strong and invincible candidate was Calvin Coolidge, who, by the death of President Harding, rose from the Vice-Presidency to the post of Chief Executive, and was in 1924 elected by the suffrage of the American people, to serve from March 4, 1925, to March 4, 1929.

The newspaper press of both the Republican and Democratic parties conceded that a second nomination for the office of President would certainly go to President Coolidge, unless he disclaimed it. When, therefore, President Coolidge wrote on a slip of paper and handed it to the newspaper men at Rapid City, S. D., where he was then staying for the summer, the words, "I do not choose to run for President in 1928," he was, by his own desire, removed from the political slate, and the field was left open for the competition of other candidates. Twice later he repeated his declaration in brief sentences.

The President throughout the campaign made no use of political patronage or of letters of confidence in favor of any pre-convention candidate. The strongest Republican candidate was

Herbert Hoover, Secretary of Commerce throughout the administrations of President Harding and President Coolidge. Alongside him in the race at this time was ex-Governor Frank O. Lowden of Illinois, the head of a great farmer's organization and the most prominent advocate of granting assistance by the national government to the agricultural interests. Other candidates, backed up by cohorts of friends, were Charles G. Dawes, Vice-President of the United States 1925-1929, and Senator Watson of Indiana.

The friends of William G. McAdoo, Secretary of the Treasury under President Wilson, and of Alfred E. Smith, Governor of New York, revived the conflict between these two men which flamed up in the Democratic Convention of 1924. In the spring of 1928, McAdoo formally withdrew his name. This left Smith in an easy position to secure the nomination.

The choice of Houston, Texas, as the place for the Democratic National Convention of 1928 seemed to acknowledge the claims of southern Democrats for recognition.

REPUBLICAN NATIONAL CONVENTION

The first National Convention to assemble was that of the Socialists, who met in New York on April 16th, and nominated Norman Thomas of Ohio for President, and James H. Maurer of Pennsylvania for Vice-President. The first great convention was that of the Republican Party in Kansas City, June 12th to 15th. Senator Fess of Ohio, a warm friend and supporter of President Coolidge, delivered the keynote speech. Every effort to keep together a powerful body of votes as an agricultural bloc, either in the convention or in the electorate, broke down. The only candidates who showed appreciable strength were Hoover and Lowden. Between those two it proved impossible to stem the nomination of Herbert Clark Hoover of California, who, on the first ballot, received 837 votes out of the 1089 total votes in the convention. Senator Charles Curtis of Kansas was nominated on the first ballot for Vice-President. For the important post of Chairman of the Republican National Committee, who would be the organizing head of the campaign, Dr. Hubert Work, Secretary of the Interior, was chosen; with whom was associated Senator Moses of New Hampshire, in special charge of the campaign of the eastern states.

DEMOCRATIC NATIONAL CONVENTION

The third nomination was made in the Democratic National Convention at Houston, Texas, June 26th to 29th. No effective candidate could be found to oppose Governor Smith, who was chosen on the first ballot by 849 ⅔ votes of the 1100 votes cast. For Vice-President, Senator Joseph T. Robinson of Arkansas, was nominated by almost a unanimous vote. The Chairman of the Democratic Committee was John J. Raskob, a wealthy manufacturer, who had previously been a Republican. An effort to nominate Senator Norris of Nebraska as a Farmer-Labor candidate broke down because he did not favor a third party.

PLATFORMS

The platforms of the two parties were of the usual cut-and-dried character in minor matters. The issues of the mode and degree of enforcement of the Eighteenth Amendment and the Volstead Administrative Act divided both parties, particularly the Democratic. Even the tariff was hardly raised as an issue in either convention. Upon two major questions both parties were divided, the enforcement of prohibition and relief to the farmers. Both platforms contained planks calling for the enforcement of prohibition as a national obligation. A plank pledging the Republican Party to a measure of farm relief failed of adoption in the Republican Convention, and no clear pronouncement on that subject appeared in the Democratic platform. Nevertheless, throughout the campaign there was hot discussion on the McNary-Haugen bill, twice vetoed by President Coolidge, which had provided an elaborate system for maintaining the established prices of agricultural products.

THE CAMPAIGN

The three actual candidates,—Smith, Hoover and Thomas—made personal canvasses throughout the country. Immense sums were raised and expended by both the main parties for campaign expenses.

Prohibition.—The most hotly contested question was one on which there was little difference in the platforms, but great divergence in the convictions of the candidates. This was prohibition, the relations of which to the campaign are discussed in detail in the article on Prohibition in this volume. The Eighteenth Amendment and the drastic Volstead Act, together with various supplementary statutes, were the foundation of an elaborate system of enforcement against the extensive illicit liquor traffic from foreign countries into the United States, and the vast manufacture, transportation and sale of alcoholic liquors within the United States. Little use was made of the numerous state prohibition and regulatory laws, which had been in force when the national amendment became effective.

Nevertheless, the spirit and effectiveness of the effort to carry the amendment into effect had to spring from the National Government; and the efficiency of the Volstead Act, the activity of the government officials, and the attitude of the courts was therefore a big issue in the presidential canvass. Governor Smith protested against the mild enforcement plank in the Democratic platform, and in an address soon after nomination proposed a national referendum as to whether there should be a national statute. He expressed himself in favor of a system by which the state should decide whether liquor should be sold. Secretary Hoover throughout stood by the national statute and national enforcement, to which the party was committed.

The attitude of the Democratic Party on the question of prohibition has been one of the principal issues in the deadlock between Smith and McAdoo at the Democratic Convention of 1924, and the Southern Democracy was deeply committed to prohibition. Hence, the stand of Smith as the Democratic candidate led to defections of old-line Democrats in those states.

RACE AND RELIGION

Another issue that proved to have a great influence in the election was the fact that Governor Smith had been born and brought up as a Catholic. Though he had not shown religious intolerance or religious bias in his political career, intense opposition arose, particularly in Protestant religious denominations strong in the South. Secretary Hoover took pains to deny for himself and his party an intolerance towards Catholics. The prejudice against Governor Smith's religion did him great harm in the strongest Democratic states. President Coolidge took no part in the campaign, except that a few days before the election he publicly expressed his satisfaction with the nomination of Mr. Hoover.

CAMPAIGN RADIO

The campaign was the opportunity for several new practices and methods and influences, which made the contest lively and pointed to new methods of arousing the voters. The first was the wholesale use for the first time of radio broadcasting for the speeches of the three principal candidates, and of many of their supporters. The effect of personal influence, through actual touch with large bodies of voters in monster meetings and demonstrations, was doubtless very great; but it was more than doubled by the use of the radio on a scale involving an expense of millions of dollars to both of the large parties. All over the Union, from the largest city to the smallest hamlets, people listened, sentence by sentence, to the arguments of the principal speakers and to the volleys of applause by which they were approved. Never in the history of the Republic had there been such publicity for the setting forth of party principles and their chief representatives in a presidential election. The system not only carried the arguments, but the personalities of the candidates

and their forceful speeches to the remotest counties. The newspapers also reported the speeches, and fought the party battles. Monster meetings were held all over the land. Nevertheless, the radio was the most important carrier of arguments and revealed the personal character of the candidates.

WOMEN VOTERS

The second great element was the influence, particularly in the votes of the women. No distinction could be made between male and female voters at the polls or in the returns; hence it is impossible to say exactly how far the votes of women may have gone toward making up the immense total of 37,000,000 popular votes cast. In most parts of the Union, systematic efforts were made to get the women's votes, and to the existing women's organizations and women speakers. Certainly the interest of women in politics, and the likelihood that women will vote according to their own convictions, have never been so strong since women won the vote by the Nineteenth Amendment. The number of women Congressmen elected in 1928 was increased; and for the first time a vigorous effort was made to secure the appointment of a woman as a member of the President's Cabinet. By common consent the women's vote was a great factor in the contest.

PREDICTIONS OF THE RESULT

A third, and very important element in the progress of the campaign, though there is no evidence that it seriously changed the minds of many voters, was the systematic and continuous canvass made and published by the *Literary Digest* during the progress of the campaign.

This method was applied in 1924, and the probable distribution of the votes, as shown by the tables of the *Digest* a few days before the election of that year, showed percentages, both in the states and in the total vote, approximating the proportions of the actual vote cast. After that statement was printed.

The same system was carried out on a larger scale in 1928, and in the weeks previous to the election a series of seven successive tables was published, showing returns from what eventually proved to be about two million persons who were willing to state what ticket they had voted four years before, and for what candidate they proposed to vote in 1928. The totals, of course, were only about five per cent of the vote eventually cast; but the percentages showed the character of the shifts from one party to another, and also the relative proportion of votes for the three national candidates in each state, on the basis of the total number who, up to that time, had sent in their statements to the *Digest*. Objections were made that this process applied only to the select groups to which the *Digest* circular had been sent; but it proved that those lists were founded on such widespread bases as the local telephone books and other tests of average people. As early as October 15th, this poll showed a very large superiority of Republican votes. This method is certain to be employed again and may come to have some of the effects of a pre-primary. The honesty and carefulness of the canvass thus made cannot be impeached. Whether any considerable number of voters were induced to change their minds, so as to cast their ballots for the winning ticket, cannot be determined.

FINANCING THE CAMPAIGN

A fourth notable thing in the campaign was the immense expenditure of the two great parties for enlightening and getting out the vote. The Republican and Democratic National Campaign Committees reported the money expended from week to week, each showing a total of about $5,000,000. By statements made public January 4th it appears that the Republican national committee paid its bills and had a surplus of several hundred thousand dollars. The Democrats registered a temporary deficit of approximately $1,500,000. Under the law, the subscribers must be made public, and heavy business men on both sides have made contributions. A large part of these sums went for radio service;

in this campaign there has been almost no suggestion of the use of money for the buying of voters or hiring them to stay away from the polls.

ELECTORAL REFORM

Official figures have not yet been issued by the national government, showing the total number of votes. The most available table, published by permission of the *Literary Digest*, is appended. The total vote of about 36,800,000 far surpasses the figures of any previous election. The total votes actually cast in the State of New York exceed the total population of the United States of America at the first presidential election in 1788-1789. It will be noted that, as against a vote of 5,000,000 for the La Follette third party candidate in 1924, all the minor parties taken together cast only about 330,000 votes. In California, Hoover's state, his vote was nearly two to one. New York, Smith's state, chose Republican electors by about 100,000 majority, though the Democratic candidates for Governor and Senator were elected. The electoral votes stood as follows:

Hoover and Curtis	444 votes
Smith and Robinson	87 votes
Thomas	0 votes

The Republicans made considerable gains in the House and Senate; the Seventy-first Congress (1929-1931) will show as follows:

Senate		*House*	
Republicans	49	Republicans	235
Democrats	46	Democrats	193
Farmer-Labor	1	Farmer-Labor	2
		Socialist	1
Total	96	Vacancies	4
		Total	435

Of the forty-eight states, six of the former solid South gave Smith decided majorities. In addition, Smith carried the old-line Republican States of Massachusetts and Rhode Island by narrow majorities. Racial, religious and prohibition arguments all had a part in this unusual result.

It has been pointed out that the change of 622,000 total votes from Hoover to Smith, if judiciously distributed in states showing moderate Republican majorities, would have given the election to Smith. On the other hand, a change of 175,000 votes, equally judiciously distributed, would have left Smith without any electoral votes. The tables and the public feeling throughout the country make it clear that the predictions of the *Literary Digest* in the last number before the election as to the percentage of votes was substantially justified.

SIGNIFICANCE OF THE VOTE

Many factors disturbed what might be called the local distribution of votes, one of them being the adhesion to the Republican ticket of all the great Central and Western agricultural states, such as Kansas, Washington and Oklahoma, notwithstanding the failure of the McNary-Haugen Bill just before the election. Another highly significant factor was the change-over of such rock-ribbed Democratic states as Texas and Virginia to the Republican ticket. This suggests a new political alignment by which the solid South may be disrupted. At the other end of the Union, New England can no longer be depended upon as surely Republican.

In no Presidential election ever held has the campaign reached such a large proportion of the voters. Newspaper publicity, public meetings on a great scale and the unlimited use of the radio placed the arguments and candidates of both major parties before the voters. The machinery of the Presidential election was carefully planned by the Constitutional Convention of 1787 to make sure that no one should be elected by a sectional vote. The election of 1928 showed that the system of state electoral votes is better, safer and more truly determined than a choice by majority of total popular votes—which might lead to serious controversy over the count of a close vote. The Republicans have a clear field in the Executive and Legislative branches of the national government.

OFFICIAL VOTE AT 1928 ELECTION

As gathered from the State Capitols by the Associated Press
(From *The Literary Digest*, January 5, 1929)

State	Electors	Hoover, *Rep.*	Smith, *Dem.*	Thomas, *Soc.*	Foster, *Workers*	Reynolds, *Soc.-Lab.*	*Pluralities*	
							Hoover	Smith
Alabama	12	120,725	127,796	460	.....	.....	.....	7,071
Arizona	3	52,533	38,537	.....	184	.....	13,996	.....
Arkansas	9	77,751	119,196	429	317	.....	.....	41,445
California	13	1,162,323	614,356	19,595	112	.....	547,967	.....
Colorado	6	253,872	133,131	3,472	675	.....	120,741	.....
Connecticut	7	296,614	252,040	3,019	730	622	44,574	.....
Delaware	3	68,860	36,643	329	59	.....	32,217	.....
Florida	6	144,168	101,764	4,036	3,704	.....	42,404	.....
Georgia	14	99,369	129,602	124	64	.....	.....	30,233
Idaho	4	99,848	53,074	1,293	.....	.....	46,774	.....
Illinois	29	1,768,141	1,313,817	19,138	3,581	1,812	454,324	.....
Indiana	15	848,280	562,691	3,871	321	645	285,589	.....
Iowa	13	623,818	378,936	2,960	328	230	244,882	.....
Kansas	10	513,672	193,003	6,205	320	.....	320,669	.....
Kentucky	13	558,064	381,070	837	293	340	176,994	.....
Louisiana	10	51,160	164,655	.....	.....	.....	.....	113,495
Maine	6	179,923	81,179	1,068	.....	.....	98,744	.....
Maryland	8	301,479	223,626	1,701	636	906	77,853	.....
Massachusetts	18	775,566	792,758	6,262	2,461	773	.....	17,192
Michigan	15	965,396	396,762	3,516	2,881	799	568,634	.....
Minnesota	12	560,977	396,451	6,774	4,853	1,921	164,526	.....
Mississippi	10	26,889	124,539	263	.....	.....	.....	97,650
Missouri	18	834,080	662,562	3,739	.....	340	171,518	.....
Montana	4	113,300	78,578	1,667	563	.....	34,722	.....
Nebraska	8	345,745	197,959	3,434	.....	.....	147,786	.....
Nevada	3	18,327	14,090	.....	.....	.....	4,237	.....
New Hampshire	4	115,404	80,715	464	173	.....	34,689	.....
New Jersey	14	925,796	616,517	4,897	1,257	500	309,279	.....
New Mexico	3	69,617	48,094	156	.....	.....	21,523	.....
New York	45	2,193,344	2,089,863	107,332	10,876	4,211	103,481	.....
North Carolina	12	348,923	286,227	.....	.....	.....	62,696	.....
North Dakota	5	131,441	106,648	842	936	.....	24,793	.....
Ohio	24	1,627,543	864,210	8,683	2,836	1,515	763,333	.....
Oklahoma	10	394,052	219,206	3,926	.....	.....	174,846	.....
Oregon	5	205,341	109,223	2,720	1,094	1,564	96,118	.....
Pennsylvania	38	2,055,382	1,067,586	18,647	4,726	380	987,796	.....
Rhode Island	5	117,522	118,973	.....	.....	.....	.....	1,451
South Carolina	9	5,858	62,700	47	.....	.....	.....	56,842
South Dakota	5	157,603	102,660	443	232	.....	54,943	.....
Tennessee	12	195,388	157,343	631	111	.....	38,045	.....
Texas	20	367,036	341,032	722	209	.....	26,004	.....
Utah	4	94,618	80,985	954	47	.....	13,633	.....
Vermont	4	90,404	44,440	.....	.....	.....	45,964	.....
Virginia	12	164,609	140,146	250	179	174	24,463	.....
Washington	7	335,844	156,772	2,615	1,541	4,068	179,072	.....
West Virginia	8	375,551	263,784	1,313	401	.....	111,767	.....
Wisconsin	13	544,205	450,259	18,213	1,528	381	93,946	.....
Wyoming	3	52,748	29,299	788	.....	.....	23,449	.....
Totals	531	21,429,109	15,005,497	267,835	48,228	21,181	.....	.....

Minor parties' vote (not included in above table):

For Varney, Prohibition—Indiana, 5,496; Michigan, 2,728; New Jersey, 160; Ohio, 3,556; Pennsylvania, 3,875; Vermont, 338; West Virginia, 1,703; Wisconsin, 2245. Total, 20,101.

For Webb, Farmer-Labor—Colorado, 1,092; Iowa, 3,088; Oklahoma, 1,284; South Dakota, 927. Total, 6,391.

Scattering—California, 261; Connecticut, 6; Louisiana, 18; Maine, 1; Wisconsin, 41. Total, 327.

Total of popular vote, 36,798,669.

Hoover's plurality, 6,423,612.

Note.—California Hoover total includes 14,394 Prohibition votes, which party indorsed Mr. Hoover. Pennsylvania Foster total includes 2,687 Labor party votes. South Carolina Hoover total includes 2,670 Anti-Smith Democrats voting for Hoover.

CONGRESS AND LEGISLATIVE INVESTIGATIONS

By Arthur W. Macmahon

Associate Professor, Columbia University

SCOPE OF LEGISLATION

The Seventieth Congress, which had originally assembled on December 5, 1927, reconvened on January 4 after the holiday recess. Despite the fact that the approaching political conventions brought the first session to a close at a relatively early date, —May 29—the enactment of 993 public and private laws exceeded the previous high mark of 896 made in the regular long session of the Sixty-ninth Congress. There was hardly time between the beginning of the short session on December 3 and its temporary adjournment on the twenty-second to add greatly to the record output. Apart from sheer quantity, the first session of the Seventieth Congress was distinguished by the consideration of many topics—like the farm surplus bill, proposals for Muscle Shoals and Boulder Dam, legislation affecting the merchant marine and barge facilities on inland waterways, and the flood control measure —which involved first-rate problems of social engineering; while the second session, focussing in the debate in the Senate of the multilateral treaty renouncing war and of the bill to authorize the construction of some $274,000,000 of cruiser construction (passed by the House on March 17), raised notable issues of international policy.

CONGRESS AND ELECTION RESULTS

The Senate.—The elections of 1926 counteracted the Republican sweep of 1924 and in part restored the balance of parties which had existed in the Sixty-eighth Congress. When the Seventieth Congress assembled, the Senators listed as Republicans numbered 48, against 47 Democrats and one Farmer-Labor member. The Republican Senator-elect from Illinois, Frank L. Smith, was definitely refused a seat, however; on December 7, 1927, by a vote of 53 (16 R., 36 D., 1 F. L.) to 28 (24 R., 4 D.), his case had been referred to the special committee on campaign expenditures, and on January 19 its adverse recommendation was sustained by a vote of 61 (21 R., 39 D., 1 F. L.) to 23 (21 R., 2 D.). No final decision was reached regarding the epublican Senator-elect from Pennsylvania, William S. Vare. On December 9, 1927, the question of his right to sit was referred to the special committee by a vote in which 17 Republicans, 38 Democrats and one Farmer Labor member joined against 25 Republicans and 5 Democrats. In the meantime the oath was withheld from Mr. Vare, while the investigation of his primary campaign was conducted by the special committee on campaign expenses (originally constituted in the Sixty-ninth Congress) and the contest between him and his Democratic opponent, William B. Wilson, was considered by a sub-committee of the regular committee on privileges and elections. The first of these was delayed by Mr. Vare's illness; the second, by Mr. Wilson's request that more time be allowed for the organization of evidence. Despite two vacant seats, the Republicans held their bare lead in the Senate; gaining a place in the replacements incidental to the three deaths which occurred during the first session, they retanied a plurality of one at its close. When the second session opened on December 3, Otis F. Glenn, Republican, having defeated Frank L. Smith in a special primary, took the seat refused to him; Theodore E. Burton, Republican, stepped into the place temporarily filled by Cyrus Locher, Democrat, after the death of Senator Frank Willis of Ohio. The nominal division in the second session stood, therefore: Republicans, 49 (not counting Vare); Democrats, 45; Farmer Labor, 1. This slightly lengthened lead was a transition to the situation which will prevail in the Senate in the Seventy-first Congress: Republicans, 54 (55, if Vare is seated);

Democrats, 39; Farmer Labor, 1.

The House.—In the House of Representatives at the opening of the first session of the Seventieth Congress the Republicans numbered 237, the Democrats 195, with two Farmer Labor members and one Socialist. Even this relatively safe margin was close in contrast with the prospective alignment in the Seventy-first Congress: Republicans, 268; Democrats, 165; Farmer Labor, 1.

Bi-Partisan Action.—Yet the voting in the Seventieth Congress gave little evidence of Republican mastery. Apart from the formal votes on the choice of the Speaker in the House (where for the first time in several sessions the Wisconsin members supported the Republican candidate, Nicholas Longworth) and on the organization of the Senate (where the progressive Republicans received assurances that caused them to refrain from interfering with such matters as the reëlection of George H. Moses as president-protem), it is almost literally true that there were no strictly party votes in either chamber during the first session. Much of the promiscuity in the roll-calls was personal in the sense that it was due to the interaction of sectional and other group influences with the localism characteristic of American legislative methods. Some of the criss-crossing, however, was the sign of what a conservative Republican, Senator Bingham of Connecticut, speaking in February, called "the strong alliance between the Democratic party and the divergents—I mean the insurgents, and the digressives—I mean the progressives . . . which has forced most of the Republicans, including myself, to be on the minority of every roll-call except one this session." Under such circumstances the chief reliance of the administration was the House organization. Even in the lower body, however, the Democrats signalized the opening of the first session by running away with the tax bill, and before its close measures as unpalatable as the joint resolution for government operation of Muscle Shoals made their way to the President's desk in the face of the patent disapproval of the House leaders.

THE PRESIDENT AND CONGRESS

Flood Control.—The complicated terms of important legislation makes it difficult, in any dispute between the President and one or both houses of Congress, to say where the victory really lies. Amid amendments which may or may not be vital concessions, either side can assert that its demands have been met. Flood relief legislation in the first session of the Seventieth Congress afforded an example. In his message in December, 1927, the President had said of the plan to combat floods in the Mississippi valley; "The Federal Government may even bear 80 per cent of such costs, but substantial local cooperation is necessary to avoid waste." The act which finally received the President's approval does not require direct contributions. It does contain stipulations regarding rights of way, flowage rights, damages and the like—important matters in view of the type of flood control that the measure seeks to promote. By shifting emphasis to these points, the President's friends could assert that his original policy had been achieved in essence.

Taxation.—Ambiguous also was the outcome in tax legislation. The viewpoint of the administration had been stated shortly before the beginning of the first session, when the Secretary of the Treasury recommended that the total reduction should not exceed $225,000,000. This, he said, might be accomplished, among other changes, by reducing the corporation income tax from 13½ to 12 per cent, by repealing the Federal estates tax altogether, and by readjusting sur-tax rates on individual incomes in the brackets between $18,000 and $70,000; on the other hand, the automobile sales tax and the tax on theater admissions should be retained. After the House had passed a bill which proposed to run the total reductions as high as $289,735,000, the Secretary on April 6 reiterated his original recommendation, except that he now advised a limit of $201,115,000. In the

end the prospective net reduction amounted to $222,495,000. The administration's plan regarding forms of taxation was flouted in some of its most important particulars. The Federal estates tax was retained; the automobile tax was repealed; there was no sur-tax readjustment; the exemption under the theater admissions tax was increased. At this price, the progressive Republican Senators, preferring debt reduction to tax reduction, gave the votes that made it possible to undo many of the provisions which had been written into the bill at the initiative of the Democrats in the House—notably, their attempt to force the corporation income tax still lower and to introduce the principle of graduation.

Use of the Veto.—The President did not hesitate to use the power of veto drastically; nor was Congress hesitant, when it could, to attempt to over-ride the Executive's disapproval. Thirteen bills were vetoed and returned to Congress; of these, three were repassed and became law; another received the necessary two-thirds majority in one house; and in two other cases measures which had been vetoed were brought unsuccessfully to a vote in at least one chamber. In addition to the thirteen items mentioned, three others—including one of the most important proposals of the session—were smothered by the pocket veto after its close.

McNary-Haugen Bill.—The most spectacular conflict between the President and Congress concerned the farm surplus bill, popularly called the McNary-Haugen Bill. The outcome was no surprise; it was taken for granted that Congress would again pass such a measure and (inasmuch as its proponents insisted that a device like the equalization fee was essential to its permanent success) it was generally assumed that a second veto would promptly follow. The bill passed the Senate first. In the course of its consideration, the revolving fund was increased to $400,000,000 by a vote of 42 (16 R., 25 D., 1 F. L.) to 30 (22 R., 8 D.). A motion to eliminate the equalization fee was defeated by 31 (18 R., 13 D.) to 46 (22 R., 23 D., 1 F. L.). On April 12 the bill was adopted by 53 (24 R., 28 D., 1 F. L.) to 23 (14 R., 9 D.). The House passed it in slightly amended form on May 13, by a vote of 204 (101 R., 100 D., 2 F. L., 1 S.) to 121 (68 R., 53 D.). On May 23 the President returned the bill to the Senate with a veto message marked by considerable acerbity. Two days later the attempt to over-ride the veto failed narrowly by a vote of 50 (20 R., 29 D., 1 F. L.) to 31 (19 R., 12 D.).

The aftermath of this veto, having figured prominently in the campaign, seemed likely to run beyond the second session into the new Congress. On December 4 Senator McNary presented a redraft of the bill, stripped of the equalization fee but carrying authorization for a revolving fund of $300,000,000 and provision for the creation of equalization corporations so that its benefits may be extended to producers who are not members of coöperative associations. In a letter made public on December 21 the Secretary of Agriculture urged that it should be enacted in time to "make it applicable to the 1929 crop." By the time of the Christmas recess, however, it seemed probable that the matter would go over to a special session of the Seventy-first Congress, along with consideration of the tariff structure. Such a postponment has been rendered easier by Mr. Hoover's statement, late in the campaign, that if necessary he would call a special session to consider farm relief. It was helped from another direction by the fact that on December 7 the House authorized the Committee on Ways and Means to conduct general tariff hearings and such were scheduled for the period between January 7 and February 25, 1929.

Vetoes Over-ridden.—Three attempts to undo vetoes were successful. The most important legislation thus involved was the long-delayed measure for the retirement of disabled emergency officers, making their position analagous to that of officers in the regular army. In the Senate the President was opposed by a combination of 24 Republicans, 41 Democrats and the Farmer Labor member

and supported by only 13 Republicans and one Democrat; in the lower house, too, the vote ran heavily against the President, 245 to 101. The other two bills concerned compensation in the postal service and were vetoed on grounds of economy. The measure to provide a higher rate of pay for night work was passed over the veto in the House by 319 (161 R., 155 D., 1 F. L., 1 S.) to 42 (39 R., 3 D.); in the Senate, 70 voted for it and only 9—all Republicans—stood with the President. The proposal to give fourth class postmasters an allowance for fuel, light and equipment received practically the same vote in the House, but in the Senate 14 Republicans and 3 Democrats supported the veto.

Vetoes Not Over-ridden.—Apart from the farm surplus bill, the unsuccessful attempts to overcome the President's objections had to do with a bill to aid in the construction of roads in unappropriated unreserved lands and non-taxable Indian lands, and a minor bill to commission bandmasters in the army. The former was repassed in the Senate on May 24 by 57 (19 R., 37 D., 1 F. L.) to 22 (17 R., 5 D.) but fell short of the required two-thirds in the House. The latter failed to repass in the Senate by 44 (11 R., 32 D., 1 F. L.) to 32 (25 R., 7 D.). Of seven other vetoed bills which were not brought to a vote, the most important was a measure for the coordination of public health activities; two related to reserve supplies and small arms practice in the army; two involved Indian tribes; and two were private.

Muscle Shoals and the Pocket Veto.—The exercise of the pocket veto gave Congress no opportunity to consider whether it would insist upon government operation of Muscle Shoals despite the President's disapproval. A joint resolution to this end, sponsored by Senator Norris, passed the Senate as early as March 13 by a vote of 48 (20 R., 27 D., 1 F. L.) to 25 (15 R., 10 D.). In the House it triumphed over formidable opposition, including a substitute leasing proposal offered by the chairman of the rules committee, which was defeated by 119 votes to 151. On May 16 the House adopted the Norris proposal without a roll-call by 251 to 165. The House amendments were accepted by the Senate conferees; they did not change the essential scheme for the completion of the installation of power units at Muscle Shoals and their operation by the national government, with preference to be given to municipalities and other public bodies in the sale of electric power not used in the developmental manufacture of nitrates. The conference report was adopted in the Senate on May 25, after a filibuster had been broken by Senator Norris's alertness and determination. The vote was 43 (16 R., 26 D., 1 F. L.) to 34 (22 R., 12 D.). The House accepted it on the same day by 211 (73 R., 135 D., 2 F. L., 1 S.) to 146 (122 R., 24 D.). President Coolidge made no direct comment but allowed the ten-day period to elapse with the measure unsigned. Two other items—for fisheries development and veterans' preference—failed in the same way. Senator Norris vigorously denied the legality of the use of the pocket veto in a recess between two sessions of the same Congress. It happened that this very question—never finally decided—was involved in a case almost sure to come before the Supreme Court (*Okanogan, etc., Indian Tribes or Bands of the State of Washington v. U. S.*, in which the Court of Claims upheld the power of pocket veto on April 16). Senator Norris stated that urther consideration of Muscle Shoals should await the outcome.

DEFEATED LEGISLATION

"Lame Duck" Amendment.—Outstanding among the measures which incurred definite defeat was the constitutional amendment to change the time for the inauguration of the President and for the arrangement of sessions of Congress—popularly called the "Lame Duck" Amendment, although its most important object is to get rid of the alternating short sessions, with their invitation to filibustering on the one hand or to drastic restriction of debate on the other. For the fourth time the proposed

amendment passed the Senate on January 4 by a nearly unanimous vote, 67 to 6, and for the fourth time was favorably reported in the House. The House committee, however, amended it by providing that the regular sessions in even-numbered years should end on May 4. In this sadly compromised form it was allowed to go to a vote. The restriction regarding May 4 was stricken out in committee of the whole by a vote of 151 to 96. Two-thirds were lacking to pass the amendment itself, however: it received 209 (89 R., 118 D., 2 F. L.) to 157 (102 R., 55 D.).

Reapportionment. — Congressional organization was also involved in another measure which, although not permanently defeated, went over to the second session. On May 18 the House recommitted a bill which proposed an automatic reapportionment of the House after each decennial census, beginning with that of 1930. The vote was 186 to 164. Despite the mandate of the Constitution, there has been no reapportionment since 1911; in the meantime Congress has fallen between the horns of the dilemma of increasing the size of the House or taking seats away from some states. At the opening of the short session the favorable reporting and passage of an amended reapportionment bill seemed certain.

PENDING LEGISLATION

Among the measures which by the end of the year had passed the Senate but not the House were the migratory bird refuge bill, adopted on April 18 without a record vote, and bills to regulate lobbying and corrupt practices, passed on March 2, approved on May 29. Among the measures which had passed the House but not the Senate was the proposal to settle the indebtedness of Greece, adopted on December 10 by 170 to 155, and the resolution to authorize cooperation with Austria's other creditors in clearing the way for a new loan, accepted on December 11 by 140 to 26. On the other hand, a seemingly decisive defeat was inflicted on the interesting bill to authorize import combinations, rejected in the House on April 6 by a vote of 120 (116 R., 4 D.) to 181 (41 R., 139 D., 1 F. L.).

LEGISLATIVE INVESTIGATIONS

Senate Activity.—In the conduct of investigations, as usual, the Senate was as full of initiative as the House was inactive. Indeed, the only inquiries ordered by the lower chamber in the first session were an interim investigation of conditions affecting Federal prisoners and the authorization of a select committee with power to look into the use of money in the national campaign. This seemingly was a merely precautionary step on the part of the Republicans and the relative inactivity of the committee (of which Representative Lehlbach of New Jersey was chairman) was hardly unexpected. In the Senate, on the other hand, over a dozen investigations were launched. The investigation of the alleged payment of large sums of money to certain senators for pro-Mexican propaganda led to a partial report on January 11, which found the charges false but asked further time to look into the ultimate responsibility for the forgeries.

Political Investigations.—The special committee headed by Senator Reed of Missouri was confirmed in its assertion of power to continue to investigate the senatorial primaries of 1926, especially in Pennsylvania. Another special committee was constituted, with Senator Steiwer of Oregon as chairman, to examine "the campaign expenditures of the various presidential candidates of both parties." In practice it concentrated on the pre-convention stage, interviewing the candidates and their managers in a series of hearings between May 7 and June 23, and it reconvened on December 5 merely to receive a tabulation prepared by its accountant. Other special committees were charged with related inquiries: the New Jersey senatorial primary of 1928; illegal appointments and removals in the civil service since 1919. Still other investigations were lodged with standing committees of the Senate.

Naval Oil Leases.—The Committee on Public Lands and Survey was in-

structed to resume the inquiry in the naval oil reserve leases, with reference especially to the activities of the Continental Trading Company and, in another direction, with reference to leases and contracts in the Salt Creek field in Wyoming. After dramatic hearings in which Will H. Hays, Secretary Mellon and others threw new light on the Republican campaign fund of 1920, the committee in its majority report on May 29 found the transactions of the Continental Trading Company marked by "the ill-got gains of a contemptible private steal, the peculations of trusted officers of great industrial houses, profiteering from their own companies, robbing their own stockholders, the share of the boodle coming to one of the freebooters serving in part as the price of the perfidy of a member of the President's cabinet." Incidental phases of this investigation were the unsuccessful attempt to convict the chairman of the board of the Standard Oil Company of Indiana, R. W. Stewart, for contempt of the Senate in refusing to answer certain questions on February 2 and 3 (for which he was acquitted by a jury on June 14), and the later unsuccessful attempt to convict him of perjury of which another jury acquitted him.

Other committee inquiries authorized by the Senate were as follows: the sinking of the submarine S-4, ordered when the Senate refused to agree to the House proposal for an investigation by a presidential commission; the alleged sale of presidential offices in Georgia; the administration of Indian affairs; the conduct of the Dallas Reserve Bank; strike conditions in the bituminous coal industry; the extension of national parks; and unemployment correctives.

FEDERAL TRADE COMMISSION AND UTILITIES

Most notable among investigations ordered and begun during the year was that of the Federal Trade Commission regarding electric power and gas utilities, with reference especially to attempts to influence public opinion and elections and to holding company control. In its original form the resolution directing such an investigation, offered by Senator Walsh of Montana, proposed to vest the inquiry in a special committee of the Senate. Despite the bitter resistance of Senator Walsh and Senator Norris, however, Senator George's amendment substituting the Federal Trade Commission prevailed on February 15 by a vote of 46 (28 R., 18 D.) to 31 (11 R., 20 D.). Before the end of the year, the sponsors of the resolution indicated that they were satisfied with the conduct of the hearings at the hands of the recently appointed general counsel of the Commission, Robert E. Healey. A series of monthly interim reports (consisting of the transcript of the hearings and available as Senate Document 92, Seventieth Congress) has been transmitted to the Senate.

SIGNIFICANT FEDERAL LEGISLATION

By Arthur W. Macmahon

Associate Professor, Columbia University

MERCHANT MARINE AND INLAND WATERWAYS

"The most important piece of constructive legislation" enacted in the first session of the Seventieth Congress, in the opinion of the Republican floor leader in the House, was the Merchant Marine Act of 1928, approved May 22. By reference, it renews the declaration in favor of a privately owned and operated American merchant marine made in the act of 1920. It seeks to encourage such a merchant marine by two devices: by loans, in connection with which it raises the revolving fund to $250,000,000, to be loaned for vessels in the foreign trade at practically the government's own interest rate, while the government carries the insurance;

and by long-time mail-carrying contracts. To these subsidiary features, which had their origin in the House, are joined two provisions which can be traced to the bill passed in the Senate on January 31 by a vote of 53 (19 R., 33 D., 1 F. L.) to 31 (23 R., 8 D.). One of these provisions is the stipulation that sales by the Shipping Board shall require five affirmative votes in the Board (instead of a mere majority of seven, as previously, or unanimously, as the bill passed by the Senate had sought to require). The other provision authorizes replacements and improvements in the government-owned fleet, to facilitate its successful operation pending its sale. The composite act was accepted by the Senate by a vote of 51 (28 R., 23 D.) to 20 (9 R., 11 D.). On the other hand, with little opposition beyond some sectional grumbling, a statute approved on May 29 increases the capital of the Inland Waterways Corporation from five to fifteen million dollars and (without endorsing permanent government operation) authorizes the extension of barge facilities to the upper Mississippi, a survey of their possible use along the Atlantic seaboard, and joint rail and barge rates.

Flood Control.—On May 15 the President approved a measure for the control of floods on the Mississippi and its tributaries. It authorizes appropriations totaling $325,000,000 and a program of work likely to require about ten years. Essentially the act accepts the plan recommended by General Jadwin, chief of the board of engineers, but it provides that a group of three—the chief of engineers, the president of the preexisting Mississippi River Commission, and a civil engineer appointed by the President from private life—shall consider engineering differences between the recommendations of the board of engineers and of the Mississippi River Commission, subject to the final decision of the President.

Boulder Dam.—The long-delayed measure for the construction of a high dam in the Colorado River again encountered a filibuster in the Senate in which the sectional pique of Arizona did service for those who opposed the bill on other grounds. Final action went over to the second session, which opened with Boulder Dam, the unfinished business of the Senate. The House, meanwhile, had passed the measure on May 25, declining to recommit it by a vote of 137 (91 R., 46 D.) to 219 (105 R., 111 D., 2 F. L., 1 S.). Somewhat amended, the bill was approved by the Senate on December 14 by a vote of 65 (32 R., 32 D., 1 F. L.) to 11 (7 R., 4 D.). On December 18 the House concurred in the amendments by 166 (79 R., 85 D., 1 F. L., 1 S.) to 122 (79 R., 43 D.), and the President signed it on December 21. In its final form the measure provides for construction of a dam at Boulder Canyon or Black Canyon, as the Secretary of the Interior decides (an interim commission of experts having recommended the use of Black Canyon), and for the construction of an all-American canal into the Imperial valley from some point lower on the Colorado. Appropriations totaling $165,000,000 are authorized. The undertaking is made contingent upon the approval of the Colorado River interstate compact by at least six states. Regarding the construction and operation of power facilities by the government, the final measure is a compromise; discretion is given to the Secretary of the Interior, but there is a proviso that in the disposition of water and power, applications from public bodies shall be given preference.

RADIO

In view of the failure of the Radio Commission to complete the work originally assigned to it by the act of 1927, a brief act was hurried through Congress and approved on March 28, by which it is continued with full powers until March, 1929; then, unless new legislation is passed in the meantime, its active functions will pass to the Secretary of Commerce. The same act also carried the so-called "Davis Amendment," adopted in the House on March 12 by a vote of 236 (150 D., 83 R., 2 F. L., 1 S.) to 134 (23 D., 111 R.). It stipulates that

"the licensing authority shall as nearly as possible make and maintain an equal allocation of broadcasting licenses, of bands of frequency or wave lengths, or period of time for operation, and of station power" among the five zones into which the country was divided by the act of 1927, and also in the states within each zone according to population.

RURAL LEGISLATION

Agriculture and Forestry.—An enlargement of the county agent system is made possible by the Ketcham Act, approved on May 22, authorizing an extra appropriation of $1,440,000 annually. The continuation of the campaign for the control of the European corn-borer is implied in the authorization, approved on May 24, of an appropriation of $7,000,000 for this purpose. In the field of forestry, a measure of constructive significance was approved on May 22, providing for a ten-year program of forest research, including the establishment of experiment stations: the act authorizes a maximum annual expenditure of $3,500,000.

Roads.—The appropriation of $75,000,000 annually for the fiscal years 1930 and 1931 was authorized by an act approved on May 26, and another act signed on May 21 further liberalized the conditions of Federal aid in states where the holdings of public lands are considerable.

LABOR AND IMMIGRATION

The most notable item in the field of labor was the measure to divest convict-made articles of the interstate character. After twenty years of effort, this was at last successful in both houses, passing the House on May 15 by a vote of 303 to 39 and the Senate on December 19 by 65 to 11. Another important enactment was a revision of the child labor law of the District of Columbia, approved May 29.

The operation of the national origins clause in the act of 1924 was again put off, now to July 1, 1929, under a joint resolution approved on March 31. An act signed on May 29 seeks to mitigate the incidental hardships of the quota system by giving a preferred status, within quotas, to wives and children under 21 belonging to aliens previously admitted.

FINANCIAL AND RATE LEGISLATION

Post-war International Settlements.—The act which is properly termed the Settlement of War Claims Act of 1928, oftener called the alien property bill, would have passed in the Sixty-ninth Congress if it had not been for the March filibuster. It was promptly revived in the new Congress, passed the House on December 21, 1927, and was approved on March 10, after the Senate had made some amendments, including provision for Austrian and Hungarian claims. It puts the maximum aggregate compensation at $100,000,000. The settlement of Serbian indebtedness to the United States was covered by an act approved on March 30.

Taxation.—The Revenue Act approved on May 29, apart from numerous administrative provisions, involves reductions estimated to entail a net loss of $222,495,000. In addition to the repeal of the Federal estates tax and the automobile sales tax, outstanding changes, with the estimated reduction of revenue, are: lowering the corporation income tax from 13½ to 12 per cent ($123,450,000); an increase from $2000 to $3000 of the credit in the case of a corporation having a net income of less than $25,000 ($12,000,000); an increase of the exemption under the theater admissions tax from 75 cents to three dollars ($17,000,000); increase of the exemption for club dues from $10 to $25 ($1,000,000); and an increase of the amount of earned income entitled to the 25 per cent credit from $20,000 to $30,000 ($4,500,000).

Postal Rates.—Reductions on rates on second, third, and fourth class matter were at last secured by an act approved on May 29, after considerable difficulty in adjusting differences of opinion between the two houses. The new legislation puts the second class levels between those of 1920 and the higher levels established in 1921. It was estimated that the com-

bined reductions would cause a loss of $16,000,000 in postal revenues if other factors remained unchanged, but it was hoped that the lower rates would bring more business. The same idea motivated an act approved on May 17, putting the minimum air mail rate at five cents per ounce, instead of ten cents for half an ounce.

Salary Increases.—The Classification Act of 1923 was amended by a measure popularly called the Welch Act, approved May 28, which provides for a general raising of salary levels, involving an estimated aggregate increase of $20,000,000.

THE PRESIDENT AND HIS POLICIES

By James Hart

Associate in Political Science, Johns Hopkins University

THIRD TERM QUESTION

Although the President had reiterated his intention to retire March 4, 1929, the Senate adopted, Feb. 10, by a vote of 56 to 26, the La Follette resolution against third terms. On March 20 Mr. Coolidge refused the request of the Wyoming Republican Central Committee that he reconsider. On April 20, he requested Massachusetts voters not to write his name on the ballot in the coming state presidential primary. But the "Draft Coolidge" movement did not entirely cease until the Kansas City Convention. Certain politicians were said to be using it for ulterior motives.

DOMESTIC POLICIES

Vetoes and Veto Threats.—Through the press Mr. Coolidge used the "threat of veto" on several occasions to influence Congress to shape measures in conformity with his views. His annual messages have also carried such threats, at least tacitly. This method was not in all cases successful. So he vetoed several bills. On May 24, the Senate in two hours overrode four out of five vetoes, two of which had been overridden by the House.

Second McNary-Haugen Veto.—Mr. Coolidge's most important veto in 1928 came May 23, denouncing in vigorous language, the second McNary-Haugen Farm Relief Bill, which retained the equalization fee. This measure, he said, was "still unconstitutional" and "little less undesirable" than its predecessor, vetoed in 1927. He emphasized six "major weaknesses and perils" of the bill, among them "its attempted price-fixing fallacy," the equalization fee as "a sales tax upon the entire community," "the widespread bureaucracy which it would set up," and "its stimulation of overproduction." This significant veto injected the farm relief issue into the approaching campaign.

Flood Control.—The President was at odds with the Mississippi Valley group in Congress in regard to the scope of the flood control plans, and whether the local communities should pay, as he desired, 20 per cent of the cost as a check upon extravagance. A White House conference with leaders resulted in a compromise, which was defeated in the House. After securing some changes from the conference committee, the President yielded, and signed the bill May 15.

Boulder Dam.—The much-debated Boulder Dam project was carried over to the short session as unfinished business of the Senate. The President signed the bill Dec. 21.

Muscle Shoals.—At the end of the long session in May a bill was sent to the President which was a victory for Senator Norris in that it provided for the government operation of the Muscle Shoals plant for the production of nitrates and power. The bill was "pocket vetoed" by Mr. Coolidge on the ground, stated later, that it put the government into the "retail" business. In his annual message the President expressed his willingness to "approve a bill" granting authority to lease the property.

FINANCIAL POLICIES

Tax Reduction.—The year opened with the President in disagreement with Rep. Garner, Democrat, of Texas, and the Chamber of Commerce over tax reduction. On Jan. 30, Mr. Coolidge told the fourteenth meeting of the Business Organization of the Government that he still opposed a reduction of more than $225,000,000. On April 3, Secretary Mellon, after studying the March 15 tax receipts, favored a cut of only $182,000,000 to $201,000,000, on account of increased appropriations. At the end of May Congress sent to the President a bill authorizing a cut of $222,495,000, some $20,000,000 more than Mr. Mellon had thought wise. This bill was signed.

Budget Estimates.—The budget estimates for the fiscal year ending June 30, 1929, had predicted a surplus of $252,540,282. At the beginning of the fiscal year, however, the Director of the Budget estimated that increased appropriations would create a deficit of $94,000,000. But in his budget message of Dec. 3, President Coolidge told Congress of the "most gratifying" prospect of a surplus of $36,990,192. Eight days later the President had to send a special message to Congress asking for supplemental appropriations amounting to $75,000,000. An underestimate of the sums needed for tax refunds would not only wipe out the surplus predicted in his budget message but create an $18,000,000 deficit. Representative Garner's charge that Secretary Mellon had "deliberately misled" the President brought a flat denial. Undersecretary Mills insisted that the revised figures on tax refunds had been sent to the Director of the Budget before Mr. Coolidge sent his budget message, and doubted if there would be any deficit anyhow. If a deficit should occur, it would be for the first time during the operation of the Budget and Accounting Act.

Appropriations.—The President's budget estimates for the fiscal year ending June 30, 1930, in his message of Dec. 3, called for increased appropriations totaling $3,780,719,647, leaving an estimated surplus of $60,576,182. This surplus, he said, was small, but "satisfactory," since it pointed to a balanced budget. He asserted that "we are committed irrevocably to a balanced budget." He warned against "any great additional expenditures," and stated that there is "no immediate prospect of any further reduction in tax rates," pointing out that four reductions had already been made.

SECRETARY WEST'S APPOINTMENT

President Coolidge was severely criticized for appointing Roy O. West to succeed Dr. Hubert Work as Secretary of the Interior. The Secretary is *ex officio* chairman of the Federal Power Commission, before which are pending some twenty applications of the Insull interests. Mr. West was thought to be closely allied with Samuel Insull, mid-west power magnate, who had contributed to the senatorial campaign of Frank L. Smith while Smith was a member of the Utilities Commission of Illinois. In the short session opposition to the confirmation of the appointment developed in the Senate. Before the Senate Committee on Public Lands West denied that his relations with Insull were close, declared he had sold his Insull interests before taking the oath of office, stated that he held no public utility stock personally, and promised not to sit in the Power Commission's hearings on applications of the Insull interests. He thought he could act judicially in power hearings. On Dec. 19, the Committee recommended confirmation, but a fight was expected on the floor of the Senate.

FOREIGN POLICIES

Sixth Pan-American Conference.—At this meeting, held at Havana from Jan. 16 to Feb. 20, the Administration pursued very definite policies to reassure Latin-American countries; to regain, so far as possible, their confidence; to justify our policies and seek to prevent outbursts of criticism, while above all forestalling any official decisions which condemned our policies or of which we did not approve. The spectacular features of

this program were the visit of the President to Havana to speak at the opening of the Conference, and the Latin-American "good-will" tour of Col. Lindbergh. The rest of the burden fell upon Charles E. Hughes, head of the American delegation.

In his address the President declared that "the sovereignty of small nations is respected," that "the smallest and the weakest speaks here with the same authority as the most powerful," and stressed Pan-American cooperation. Our position was made more difficult by the fact that the week-end before the Conference opened saw the landing of 1,200 additional marines at Corinto, Nicaragua, and the killing of 40 of Sandino's men by a marine airplane bombing squadron. But Mr. Hughes proceeded with consummate skill. He seconded the motion for open sessions. He tried to avoid any appearance of domination, was meticulously courteous, and on Jan. 21, before the American Chamber of Commerce, declared that we did not wish the territory of any Caribbean country, and promised with reference to Nicaragua that "we shall retire as soon as it is possible." Pan-Americanism, he said, rests upon four pillars: independence; stability; mutual good-will; and cooperation.

Mr. Hughes was unable to prevent attacks upon our policy of intervention by Señor Guerrero, of Salvador, and of our tariff policy by Dr. Pueyrredon, of Argentina. But he kept the Conference from taking any hostile action, and prevented both the breakup of the Pan-American system and the transformation of the Union into a sort of political league or a customs union. His diplomacy was masterful. His speech of Feb. 18 on intervention is a memorable statement of policy.

Kellogg Peace Pact.—At the end of 1927 it had appeared to some that the Administration was slow to take up M. Briand's suggestion that France and America renounce war as between themselves. But in 1928 Mr. Kellogg pushed negotiations looking to a multilateral renunciation of war. The French drew back, and for a while our plans seemed doomed to failure. But the Secretary, after several exchanges, finally got France to agree to the multilateral feature, and to the "outlawry of war," not merely of "aggressive" war, as an instrument of national policy. The scheme was eventually accepted by the Great Powers, and was signed at Paris Aug. 27 by fifteen nations, who invited all others to adhere. Mr. Kellogg made it clear that the treaty did not exclude self-defense, while in correspondence England had reserved freedom of action in certain areas. Some saw in the treaty a noble gesture, others a salve for the American conscience which might make us think we were doing our full duty in the interest of peace, and still others a most significant step towards an ordered world. Other countries soon expressed their desire to adhere. For a time in December it seemed that the Senate "irreconcilables" might threaten its acceptance by that body. But the President took personal interest in the fight; and it stands a good chance for acceptance.

Naval Policy.—Apparently it was the failure of the 1927 three-power naval conference that led the President to advocate a cruiser building program. On Sept. 28, the United States declared in identic notes to England and France that the Anglo-French naval accord or "compromise" was entirely unacceptable to us as a basis for naval disarmament. In November Lord Cushenden told the House of Lords that the accord was dead.

The short session found the cruiser bill still before the Senate. In his annual message the President recommended that this bill, calling for 15 new cruisers, be passed, with the elimination of the clause requiring that the ships must be laid down within a fixed time. Some hold the President's stand to be a threat to force naval "disarmament" agreements. Mr. Coolidge denied that we intended to enter upon naval competition.

FOREIGN LOANS

French Industrial Loans.—It became known Jan. 15, that the government had lifted the ban against

the flotation in this country of industrial securities of countries that had not settled their war debts to the United States. The ban, in effect three years, had been an irritant, and loans had only been able to be made indirectly.

Soviet Recognition and Loan Ban.—In February Mr. Kellogg formally opposed a $30,000,000 Russian Railway Loan, saying his Department did "not view with favor financial arrangements designed to facilitate in any way the sale of Soviet bonds in the United States." In April he reasserted opposition to recognition of the Soviet Government, adding, however, that the American government did not oppose trade with Russia. The Secretary did not object to Russian adhesion to his peace pact, and when on Aug. 31 that country expressed to France a desire to adhere, he held that this would not involve recognition by us, since the Soviet Government adhered to the pact, not to the United States.

ASIA

China.—It was announced, April 1, that Minister MacMurray had reached a satisfactory agreement with the Nationalist Government over the Nanking incident of last year. The entrance of the Nationalists into Peking in June made the situation in China seem more hopeful. But their conflict with the Japanese led Dr. Hornbeck, of the State Department, to say on May 11, in an address, that our Government "will not look with favor upon measures tending to break up China or establish spheres of influence there." About a week later the State Department let it be known that it recognized no special claim of Japan in Manchuria. July 27, it was announced that we had recognized the Nationalist Government by signing with it a treaty giving China the right to levy tariff duties so soon as the other Powers did likewise. In this we took our customary lead in action favorable to China.

LATIN AMERICA

Porto Rico.—President Coolidge, in a letter made public March 15, rejected the plea of the Porto Rican legislature that the island be granted the *status* of a "free State." He denied that this had ever been promised, and declared that the Porto Rican government "at present exercises a greater degree of sovereignty over its internal affairs than does the government of any State or Territory of the United States." The island, he said, was represented at Havana by the United States Government.

Mexico.—On March 27 President Calles signed regulations which were satisfactory to the American government with respect to the long-drawn-out oil controversy. The Mexican situation showed general improvement. Credit for this belongs especially to Ambassador Morrow, whose appointment has proved one of the happiest of the Coolidge Administration.

Nicaragua.—Fighting between the marines and the Sandinists continued far into 1928. Despite some opposition from the Conservatives, President Diaz signed on March 21 a decree for the supervision of the presidential election by Gen. McCoy. Between mid-June and mid-July nearly 600 rebels surrendered to the marines. On Nov. 4, a supervised election was held in an orderly manner, the Liberals winning the presidency. On Nov. 23 the White House and the State Department repudiated the proposal, made in a report by Dr. W. W. Cumberland, that we supervise the finances of Nicaragua. In some quarters this was held to be a change in policy. On November 27, Mr. Hoover, off Corinto, entertained Diaz, Chamorro, and President-elect Moncada, congratulating them on their leadership.

WORLD PEACE

World Court.—On November 24, the President indicated to Republican Senators at a White House breakfast that he desired to come to some agreement with the other members of the so-called World Court concerning the Senate's reservations. It was not indicated whether negotiations had already begun.

Pan-American Arbitration Conference and Bolivian-Paraguayan Dispute.—The Pan-American Conference of Arbitration and Conciliation convened in Washington, Dec. 10, with Argentina absent. Its attention at the outset was centered upon the border dispute between Bolivia and Paraguay, which led to hostilities. The conference offered mediation, and M. Briand, for the League of Nations Council, "insisted" that the obligations of the Covenant be observed. Finally, both nations accepted the offer of the Conference, and Secretary Kellogg expressed the desire that that body rather than the State Department undertake the task. About Dec. 20, the arbitration of pecuniary claims against governments began to promise differences of opinion within the Conference. The absence of Argentina was attributed to her failure at Havana and taken as a blow at Pan-Americanism.

PRESIDENT'S ARMISTICE ADDRESS

One of the President's most significant utterances of the year was his address of Nov. 11. He gave a general review of our post-war relations with Europe. He declared our resources "delivered Europe from starvation and ruin" after the war, from which he denied that we had made a profit. No citizen, he declared, needs to apologize "to anybody anywhere" for our not having done our duty in defense of world liberty. "It no doubt has some significance that foreign governments made agreements limiting that class of combat vessels in which we were superior, but refused limitation in the class in which they were superior." Our war debt policy has been based on "the merciful principle" of ability to pay. "We have given of our counsel when asked." European stability and prosperity now justify our not helping "much beyond a strict business basis." "We are against aggression and imperialism." Our possessions, except the Canal Zone, are a hindrance rather than a help. "We hold them not as a profit, but as a duty." We want limitation of armaments, but can bear their expense "better than anyone else." "We have not wished to contribute to the support of armaments" by our financial policy toward England and France. We desire to have the war debts settled, but could probably "better afford to lose them than our debtors could afford not to pay them." Yet we should pursue our course "with due humility," and meet "the gravest responsibilities that can come to a people in accordance with the requirements of conscience and righteousness."

LAST ANNUAL MESSAGE TO CONGRESS

This document was sent to Congress Dec. 4. It contained the usual Coolidge refrain of optimism over the "era of prosperity more extensive and of peace more permanent" than ever before. "The main source of these unexampled blessings lies in the integrity and character of the American people." But he warned that peace and prosperity are not finalities, but only methods. Under their influence it is easy to become "selfish and degenerate." Furthermore, he reminded us that they "can easily be lost." "I wish to repeat again," declared the President, "for the benefit of the timid and the suspicious that this country is neither militaristic nor imperialistic." He stated that during the last year the government had signed eleven arbitration treaties, and that twenty-two more were under negotiation. However, we needed more cruisers for defense. The President reviewed his administration with satisfaction, and among his recommendations were railroad consolidation and farm relief legislation along the lines proposed by Mr. Hoover during his campaign.

FEDERAL ADMINISTRATIVE COMMISSIONS

By Lloyd M. Short

Professor, University of Missouri

INTERSTATE COMMERCE COMMISSION

Rejection of Esch.—The Senate, on March 16, refused to confirm the nomination of John J. Esch of Wisconsin for reappointment by a vote of 39 to 29. Senators from states in the southern coal fields charged that Esch had not only voted with the majority of the Commission in 1927 in refusing permission to railroads serving the southern coal fields to reduce rates on lake cargo coal—which they insisted was in excess of the powers of the Commission—but had changed his views on that subject, since the decision of the Commission in the lake cargo freight rate case of 1925, because of threatened opposition to his reappointment from Pennsylvania. The charge of senators that the Commission had attempted to equalize prosperity between competing sections by prescribing minimum freight rates was denied by Mr. Esch and other members of the Commission. Mr. Esch was defended by his colleagues against the charge that his change of vote in the two cases was due to political influence.

The Appointment Issue.—While committee hearings were in progress on the nomination, Senator Reed of Missouri reviewed the history of the lake cargo rate cases, calling special attention to the attitude of Pennsylvania in opposing the reappointment of Commissioners Woodlock and Cox, and in demanding the appointment of Woods, in order to influence the decisions of the Commission. Senator Neely, after the final vote, declared the action "is very emphatic warning that the Senate will not tolerate the packing of these important commissions by President Coolidge in favor of Pennsylvania or any other section, or in favor of any particular interests in the country." The President and members of the Commission expressed opposition to the practice of appealing rate decisions to the Senate by withholding confirmation of a commissioner, as tending to impair the independence of the Commission, and making it difficult to secure experienced men for the position.

Minimum Freight Rates.—The authority of the Commission to prescribe minimum rates was challenged successfully in Anchor Coal Co. *vs.* United States in the U. S. District Court at Charleston, W. Va. The court granted an injunction suspending the order of the Commission, dated February 25, denying Southern carriers permission to reduce freight rates on lake cargo coal. A petition of Ohio coal operators and Northern railroads to overrule the injunction was later denied by the Supreme Court. As a result, bills were introduced in both Houses of Congress prohibiting the Commission to fix minimum rail rates except to meet water competition, but they were not acted upon.

Railroad Consolidation.—In its annual report for 1927, the Commission asked Congress to enact further legislation on the question of railroad consolidation. It urged the repeal of the requirement for adoption of a general plan of unification, and recommended that broader powers be given to approve consolidations proposed in the public interest. The suggestions of the Commission were embodied in bills introduced in both Senate and House, but no final action was taken. Some disposition of them is expected during the short session of the Seventieth Congress.

Little progress was made during the year in railroad consolidations under existing statutes. The Chesapeake & Ohio was permitted to acquire control of the Père Marquette on conditions but not of the Erie. Additional hearings have been made necessary, however, by an increase in the price of Père Marquette stock. The Baltimore & Ohio, New York Central, and New York, Cincinnati & St.

Louis were forbidden to serve as directors of the Wheeling and Lake Erie, as a part of the "four system" plan. Application of the Missouri, Kansas & Texas for control of the St. Louis, Southwestern and Kansas City Southern was withdrawn, after the Commission revoked the authorization granted in 1925 to L. F. Loree, chairman of the Board of the Kansas City Southern, to serve as a director of the M. K. & T.

Railroad Valuation.—The St. Louis and O'Fallon recapture case continued to attract attention, because it involves fundamental considerations that enter into railroad valuation for purposes of rate-making, as well as the recapture of excess earnings under the Transportation Act of 1920. Unfortunately, the decision of the lower court sustaining the Commission, rendered Dec. 10, 1927, did not meet the issue as to valuation methods employed by the Commission but only as to whether the income retained by the company was confiscatory in effect. The decision was appealed to the Supreme Court, and briefs were filed Dec. 13, 1928. The railroad does not demand valuation based solely upon cost of production at current prices, but insists due consideration be given to reproduction costs. Both the carriers and the Commission are desirous of having the Supreme Court face the issue of valuation methods. An innovation was introduced in this case when the Senate, on May 7, passed the Norris Resolution requesting the Supreme Court to permit counsel for the National Conference on Valuation of American Railroads to appear as *amicus curiæ* and present briefs and oral arguments in the case.

Violations of Clayton Act.—The first complaint of its kind ever issued by the Interstate Commerce Commission charged the Kansas City Southern with a violation of the Clayton Anti-Trust Act in acquiring without authorization of the Commission a large part of the stock of the M. K. & T. and the St. Louis Southwestern, in that the effect of use of the same in voting might be substantially to lessen competition or restrain commerce in certain sections and commodities. This case grows out of the famous "Loree merger" proceedings in which the Kansas City Southern, after acquiring a stock interest in the other roads, asked the Commission to authorize control of them, which was denied. A similar complaint was filed against the M. K. & T. for acquiring stock of the St. Louis Southwestern. Hearings were postponed. The M. K. & T. has asked for a dismissal of the complaint, having returned its holdings of St. Louis Southwestern stock to the Kansas City Southern.

Joint Rail-Water Rates.—The Commission is directed by the Barge Line Act of May 29, 1928, to establish joint rail-and-water rates and routes *via* the barge lines on the Mississippi River and other inland waterways. Following a conference on Oct. 12 with members of Congress and representatives of the railroads to determine the full intent and meaning of the act, the Commission, in an interpretive decision rendered Nov. 18, ruled that it was empowered to order any railroad to make joint rates with the Mississippi and other river barge lines without preliminary hearings. Counsel for the railroads protested that such procedure would be unconstitutional. Thus it seems likely that the power of the Commission under this act will be tested promptly in the courts.

FEDERAL TRADE COMMISSION

Investigation of Utilities.—Senator Walsh of Montana again introduced a resolution Dec. 17, 1927, proposing an inquiry by a special Senate committee into the financing and control of public utility companies, and into any attempts made by such companies to carry on propaganda to influence public opinion on questions of ownership of sources of power, or the generation and distribution of power. The resolution was passed by the Senate Feb. 15 by a vote of 46 to 31, following the adoption of an amendment, over the protest of Senator Walsh and his supporters, referring the inquiry to the Federal Trade Commission. Possibly spurred on by the

criticisms directed against it during the Senate debate on the adoption of the amendment, the Commission proceeded promptly and energetically to prosecute the inquiry. The Senate resolution called for public hearings and monthly progress reports which was unique in that the Commission had not heretofore conducted public hearings in connection with its economic investigations, and had not made public its reports until all work had been completed and approved.

It was evident at the outset that the financial part of the investigation would be complicated, and that preparations of exhibits to be introduced at hearings would require much detailed work, so public hearings were begun first in connection with the propaganda phase of the inquiry, while examiners were sent out to get data for the financial survey. Hearings were begun March 8 and were continued until Nov. 1, except for a summer recess of two months. They will probably be resumed early in 1929. To date, a mass of testimony covering the propaganda activities of the utilities in all states and sections of the country has revealed the expenditure of large sums of money in employment of speakers, distribution of literature, preparation and revision of textbooks, use of the newspapers, and other means of publicity, designed to create public sentiment favorable to private ownership and operation of sources and distribution of power. Legislation was introduced in the short session of the Seventieth Congress by Senator Walsh designed to meet conditions revealed by the inquiry.

The refusal of representatives of the Electric Bond and Share Company in October to produce certain financial records requested by the Commission led the latter to file an application in the District Court for the Southern District of New York Dec. 2 for authority to compel officers and employees of the company to produce records desired by the Commission in carrying out its inquiry. The petition charged that the company, through its connections, "possesses a virtual monopoly of the sale and transmission of electrical energy in interstate commerce," constituting a burden on such commerce, and that the records refused "are necessary to determine whether such burden has, in fact, been created in violation of the anti-trust laws."

THE TARIFF COMMISSION

Costigan's Resignation.—The sharp differences of opinion held by members of the Tariff Commission were brought to the fore again by the resignation of Edward P. Costigan of Colorado, the last of the original members of the Commission. He directed a letter of explanation to Senator Robinson, chairman of the Senate committee appointed in 1926 to investigate the Commission, placing full responsibility for the failure of the Commission to function as the law intended upon Presidents Harding and Coolidge, whom he charged with having made appointments deliberately designed to pack the Commission with rabid protectionists. The so-called "Marvin group," composed of Commissioners Marvin, Lowell, and Brossard, were said to have worked steadily for higher rates and against important reductions, "reckless on occasions in their treatment of facts and law." The other members of the Commission insisted that Costigan had failed to appreciate the fact that those who could not follow him had been as conscientious in the performance of their work as he had been, and that he had attempted to either rule or ruin the Commission.

Repeal of Flexible Tariff Urged.—The select committee of the Senate appointed by the Sixty-ninth Congress to conduct an investigation of the Tariff Commission and the operation of the Flexible Tariff Act of 1922, submitted its report on May 29. The majority report, signed by Senators Robinson, Bruce, and LaFollette, recommended the repeal of the flexible provisions of the 1922 Act, holding that experience had not demonstrated its value, that the President could not devote sufficient time properly to discharge the duties it imposes, and that tariff making and revision are

legislative functions which should not be delegated. It recommended that the Tariff Commission be made a Congressional agency, and that it should propose tariff revisions direct to Congress. Senator Reed of Pennsylvania in a minority report agreed that the record of the Commission had been disappointing, but attributed this situation to wrangling among the members and fear of criticism, which conditions he felt had disappeared.

FEDERAL RADIO COMMISSION

Davis Amendment.—Senator Watson's bill extending the life of the Radio Commission for one year passed the Senate Feb. 6. The House Merchant Marine Committee reported the bill to the House with several amendments, the most important of which provided for an equal allocation of station power and wave lengths among the five broadcasting zones, and a fair and equitable allocation among the states within each zone on the basis of population. The debate over this amendment in the House was stormy, and the vote of 236 to 133 in favor of the amendment found the House split along rural and urban lines, the former supporting the proposal. The supporters of the amendment charged that concentration of radio stations in New York and other large cities primarily benefited an alleged monopoly in the industry which, they contended, consisted of the General Electric Co., the American Telephone and Telegraph Co., the Westinghouse Co., and the Radio Corporation. They insisted that the Radio Commission was inclined to favor applications for licenses from large cities. The Senate accepted the amendment and the bill was approved by the President March 28. Meanwhile the life of the Commission had expired March 15, under the provisions of the Radio Act of 1927. Secretary Hoover, under whose jurisdiction the administration of the Act was to pass following expiration of the Commission, requested that body to continue to act as a control agency in all matters pending before it until Congress could act finally upon pending legislation.

Personnel.—Following passage of the act extending the life of the Commission, the Senate confirmed the nominations of four members, Sam Pickard, Kansas, Democrat; H. N. LaFount, Utah, Republican; Orestes H. Caldwell, New York, Republican; and Ira C. Robinson, West Virginia, Republican. Commissioners Pickard, LaFount, and Caldwell had been serving under recess appointments, but Judge Robinson was a new appointee, having been named to succeed Rear Admiral Bullard, deceased. President Coolidge found it difficult to secure a man for this place with judicial experience as his choice was limited by the Radio Act to the second zone area, and he expressed publicly his opposition to such legislative restrictions on the appointive power of the chief executive. Commissioner Caldwell, one of the original members of that body, was confirmed by the narrow margin of a single vote. Opposition to Caldwell was led by Senator Dill and was based largely on a letter written by Caldwell opposing the Davis Amendment.

The act of March 28 provides that the term of office of all the Commissioners shall expire on February 23, 1929, and that thereafter the members shall be appointed for terms of 2, 3, 4, 5, and 6 years respectively, as stipulated in the act of 1927. Thus for the first time, all of the members of the Commission were confirmed, and appropriations for salaries and expenses of the Commission for the fiscal years 1928 and 1929 were carried in the first and second deficiency appropriation acts.

Reallocation.—The Radio Commission on May 26 began the work of reallocation in accordance with the provisions of the Davis Amendment by notifying 165 broadcasters to show cause why their licenses should be renewed at the expiration of 60 days. These stations were given an opportunity to appear before the Commission for a hearing on July 9, and two months later the Commission published a final list of its decisions, together with a reallocation of radio facilities by zones, and the state quotas of radio channels. Approximately

one-half of the stations cited to appear before the Commission were refused renewals of licenses or were reduced in power. On September 11 the Commission made public its complete plan, involving changes of frequency and power assignments, to go into effect November 11 at 3 A. M., Eastern Standard Time. The plan, as adopted, was approved by four of the five members of the Commission, who interpreted the Davis Amendment as requiring an immediate reallocation of broadcasting facilities so as to attain the prescribed equality. Chairman Robinson dissented, holding the view that the amendment merely indicated a policy to be pursued in the future by gradual steps without calling for any general rearrangement of stations immediately, and that equalization was to be accomplished when and in so far as there were applications. Hearings were held by the Commission on October 16 to give stations an opportunity for final appeal, and decisions were made prior to November 11. The reallocation seems to have met with general approval. Most of the complaints received have centered around a few specific local cases of station time-sharing or interference, while the Commission has received many evidences of approval of the plan, particularly from those whose locations away from large cities force them to depend upon distant stations for their regular programs.

Litigation.—Several cases pending in the courts involve first tests of the Radio Acts of 1927 and 1928 and the authority of the Commission thereunder. The most important is that of Station WGG, Schenectady, N. Y., operated by the General Electric Co., which applied to the Court of Appeals of the District of Columbia on Nov. 9 for a stay of the Commission's order placing it on a part-time basis. The appeal was granted, pending a hearing of the case upon its merits early in December. The station insists it is making no attack upon the Act, but merely wants to question the Commission's authority to divide wave lengths as it did in the reallocation.

The first case against the Commission to come to trial was that of WCRW, Chicago, which sought an injunction to prevent a reduction in power. This case involves a test of the Commission's authority, and is under advisement in the Federal Court in Chicago. Two other suits, brought by stations WMBB-WOK of Chicago and WTRL of Midland Park, N. J., involve major tests of the Radio Act itself, these stations having been denied a renewal of their licenses. These suits challenge the authority of the Government to deprive stations of property rights. Finally, two cases pending involve the Commission's authority and discretion in refusing to grant short waves for point-to-point communication.

THE SHIPPING BOARD

The Jones-White bill, known as the Merchant Marine Act of 1928, amends the provisions of the Merchant Marine Act of 1920 and the Shipping Act of 1916. This legislation was, in part, the result of recommendations submitted by a national conference of private American steamship operators, owners, and builders called by the Shipping Board, which met in Washington Jan. 10 and 11. The Act affirms the statement of policy and purpose contained in the Act of 1920; namely, that it is necessary for the national defense and for the proper growth of its foreign and domestic commerce that the United States shall have a merchant marine of the best equipped and most suitable types of vessels sufficient to carry the greater proportion of its commerce, and serve as a naval or military auxiliary in time of war or national emergency, ultimately to be owned and operated by citizens of the United States.

Among the outstanding features of the new Act is the provision that the Shipping Board shall not sell any vessel or line except upon the affirmative vote of five members of the Board, and then only when in the judgment of the Board the sale will best serve the building up and maintenance of an adequate merchant marine. There are seven members of

the Shipping Board, and heretofore the affirmative vote of a majority of the Board has been sufficient to approve a sale. The bill, as first passed by the Senate, provided that no sale should be made except by the unanimous vote of the Board. This provision was criticized by the President as tending to make one member of the Board a majority, especially in view of the fact that one of the present members of the Commission was known to have consistently opposed any sales. The President did not favor the provision in the bill as finally passed, stating that it made for minority rule, and intimating some changes in the personnel of the Board might be necessary if it were adopted.

The new Act authorizes the Board to remodel and improve its vessels so as to equip them adequately for competition in the foreign trade of the United States. It recognizes the necessity for replacements and additions in the government fleet, in order to give the United States an adequate merchant marine, and authorizes and directs the Board to present to Congress, from time to time, recommendations as to new construction. It increases the construction loan fund to $250,000,000 and liberalizes the terms under which loans may be made for new construction or for reconditioning, remodeling, or improving vessels already built. The loan period is extended to 20 years; a lower rate of interest is provided for vessels operated in foreign trade; and loans are authorized for sums equal to three-fourths of the cost of the vessel or vessels to be constructed, or for three-fourths of the cost of the reconditioning or remodeling work.

Sale of Government Lines.—The policy of the Shipping Board during the year in the sale of Government-owned vessels and lines carries out the desires of the President and those in Congress who favor immediate transfer of the merchant fleet to private ownership. The Board, on February 16, sold the three remaining government-owned cargo lines in the Pacific fleet, and on July 3 announced that it had decided to offer for sale three Atlantic lines, including the last exclusive passenger service. One of these, the American Palmetto Line, composed of cargo vessels, was sold Sept. 25. The date for opening of bids for the sale of the other two lines, the United States Line and the American Merchant Line, was postponed from Nov. 15 to Jan. 15, 1929. If these lines are sold, the Board will have reduced its lines to twenty-one cargo services of 230 vessels, and will have withdrawn entirely from passenger service. Several members of Congress have criticized publicly the action of the Board in offering these lines for sale, but the chairman, T. V. O'Connor, stated Nov. 21 that the Board expects within the next ten years to sell 8 or 10 additional lines, believing that such action carries out the policy of the Act of 1928 and the wish of the American people.

FEDERAL POWER COMMISSION

Water Power Licenses.—The failure of the House of Representatives to pass the Burton bill providing for an increased personnel for the Federal Power Commission, apparently based on the supposition that to do so would mean the permanent establishment of another regulatory commission, led the Commission to announce on May 29 that it would, temporarily, cease to issue further water power licenses. It stated that, with its limited force, it could not fully protect the public interest in the issuance and administration of licenses, and that it would require double its present force to catch up in the next five years on work already accumulated. The situation was gradually getting worse due to the influx of applications for licenses and to research and accounting work that must follow the granting of such licenses. Hence the order was issued to prevent an accumulation of work that would leave the Commission hopelessly behind.

CIVIL SERVICE COMMISSION

Prohibition Service.—Funds were granted by Congress in the first De-

ficiency Appropriation Act, approved Dec. 22, 1927, to permit the Civil Service Commission to carry out the Act passed by the Sixty-nine Congress placing the personnel of the Prohibition Bureau under the classified civil service. Certification of eligibles for administrative positions began in January, while eligible applicants for positions below the administrative grade were certified by the Commission in August. Approximately 85 per cent of the prohibition agents in the service failed to pass the first test, thus making necessary a second series of examinations. Considerable criticism was directed against the Commission because of this large percentage of failures, on the ground that persons who had served as agents for any considerable length of time must have demonstrated their fitness. The examinations were declared to be too academic and impractical. Commissioner Doran was quoted as saying that the large number of failures was certain to cause discontent and make potential grafters of many who were rejected. Senator Brookhart and Representative Robinson of Iowa introduced identical bills during the first session of the Seventieth Congress authorizing the Prohibition Commissioner to retain in office, without examination, any existing incumbent who had served one year or more, but no action was taken upon them. These bills were opposed by the friends of civil service reform, who declared they would open wide the doors to political and personal favoritism, and who insisted that the large percentage of failures in the first test merely revealed the extent to which the service had been manned by an incompetent personnel.

NATIONAL STATESMEN

By James Hart

Associate in Political Science, The Johns Hopkins University

PRESIDENTIAL CANDIDATES

Herbert C. Hoover.—To close students of politics it seemed during the campaign that Mr. Hoover was applying Mr. Frank Kent's rules for success. Seven years in the Cabinet had identified him as a "Coolidge Republican." During the fight for the nomination his managers worked with the state machines. On several occasions, his vague statements indicated he could employ "the art of seeming to say something without doing so." While his campaign was not of the "front porch" variety, he made fewer speeches than his rival, with whom he never came to grips. His nearest approach to debate was when he termed Governor Smith's proposals on prohibition, water power and farm relief, "state socialism." Large portions of his speeches were essays on the American home, equality of opportunity, and the Republican policies which have given us the "full garage." His ablest utterances related to the tariff and the coöperation of government with business and social enterprises. He handled the "hot pokers" with gloves.

The election won, the President-elect may be expected to give in many ways a brilliant administration. He carries to his high office notable gifts. He has demonstrated a veritable genius for organizing vast enterprises and pushing them through to a successful conclusion. He has probably been our ablest and most constructive Secretary of Commerce. He has had wide experience, and is familiar, as are few persons, with world trade and domestic business. No President has ever been so familiar as he with conditions abroad. His first big decision, to go on a "good-will" trip to Latin-America, illustrates his keen business sense. He has intelligence, common sense and resourcefulness of a high order. He is the first expert ever to have been made President. As a holder of elective office and a political leader, he is untried. His policies will be constructive, and may be rela-

tively liberal. If he can effectively handle Congress, lead public opinion, dominate the politicians and groups that helped elect him, and revive the progressivism of Roosevelt, he will make one of the six greatest American Presidents.

Alfred E. Smith.—That Governor Smith made one of the greatest Governors of New York is the verdict of competent judges in both parties. It was fitting that the Houston Convention should give him his chance on the national stage. The result was to lead his friends to admire him the more ardently, and his enemies, somewhat more numerous, to hate him the more intensely. His campaign involved deliberate strategy. It aimed to reassure business, win the "wet" vote of the large cities, and capture the western progressives and farm relief advocates, trusting that party loyalty would take care of the South. Thus he made John J. Raskob, of the General Motors Corporation, his manager, pledged at Louisville tariff protection to everybody, advocated modification both of the Volstead Act and of the Eighteenth Amendment, lined the pockets of Mr. Peek for work in the farming regions, and, without committing himself to the equalization fee, promised to carry out the "principle" of the McNary-Haugen plan for government handling of exportable agricultural surpluses.

This strategy split the Solid South in two, and failed to win the East or West. His ideas on prohibition were of doubtful workability. His farm relief stand was clever rather than specific. He failed to convince the country that Coolidge economy was a "myth." His statements on international relations were nothing short of naïve. He avoided the "hot poker" of the League of Nations, and here, as in his tariff stand, seemed to place expediency before principle. His blanket promises to "solve" various difficult problems were demagogic. His mud-slinging tactics and his vulgarities of speech, dress and manner drew crowds but lost votes by making him appear, to many, socially disqualified for the position of *chef d'état*. In addition, he was the focal point of enough antagonisms to have made any other man obviously "unavailable" for the nomination.

Though he has now gone into eclipse, Governor Smith demonstrated, during the campaign, resources of a rare character in our public life. His sheer courage in denouncing the Ku Klux Klan and the Anti-Saloon League excited admiration from many opponents. His frankness on the religious question showed a method few politicians dare employ. His replies to attacks upon his personal character took the breath of readers. His aggressiveness and outspoken language injected a needed wholesomeness into our public life. His denunciation of the so-called power "trust" and his water-power policy were truly liberal and constructive. But for certain limitations and certain popular prejudices, his personal magnetism, his human sympathy, the appeal he had for youth, his vigor, his self-confidence, his courage, his integrity, his constructive bent, his capacity for growth, his ability to state issues in simple terms, his faith in direct appeal to the people, and his power in attack might have made him one of the great political leaders of our time.

CABINET MEMBERS

Frank B. Kellogg.—With the clearing up during the year of the situations in China, Mexico, and Nicaragua, the Secretary of State had a smoother course than in 1927. His policy toward China has been commendable and in line with the State Department's tradition. On February 4, in a letter to Chairman Porter of the House Foreign Affairs Committee, he represented our government as willing to join all nations in prohibiting the construction and use of submarines, but stated we could not act alone in the matter. It is doubtful whether the weaker naval powers would agree to this. It was through his good offices that Chile and Peru agreed in July to resume diplomatic relations after seventeen years. He merely followed diplomatic practice when he refused in December

to accept Prime Minister Baldwin's reply to a letter sent directly to the latter by Chairman Britten of the House Naval Committee, proposing a joint committee meeting of the two national legislatures to discuss naval disarmament.

The Secretary was made Chairman of the Pan-American Conference on Conciliation and Arbitration which met in Washington in December; was instrumental in persuading Bolivia to remain at the Conference despite her dispute with Paraguay; and expressed the desire that the Conference rather than the State Department mediate in this threatening dispute. But his chief fame as Secretary of State will probably rest upon his transformation of M. Briand's original suggestion into an enlarged plan for the so-called "outlawry" of war; his success in insisting that this plan be multilateral, and that it should not specify "aggressive" wars only; and the association of his name with the resulting treaty signed at Paris in August.

Andrew D. Mellon.—The Secretary of the Treasury continues after another year to hold the almost unprecedented confidence of the business world. In March he was forced to admit he had failed to disclose to a Senate investigating committee the scheme of Will Hays to cover up contributions of Harry Sinclair, oil magnate, to the Republican Party. This did not seriously damage his prestige, though his resignation was demanded in vain by Senators Cousens and Norris. The Treasury lost its allegedly "punitive" tax suit for $10,000,000 against Senator Cousens. In December, the Secretary denied that he had "deceived" the President about a possible deficit, as Representative Garner had charged; and Under Secretary Mills doubted if there would really be a deficit.

DIPLOMATS

Charles Evans Hughes.—The prestige of this elder statesman was enhanced; first, by his election in September by the League of Nations to fill the unexpired term of John Bassett Moore as a member of the Court of International Justice at the Hague; and second, by the demonstration, at the Sixth Pan-American Conference at Havana in January and February, of his consummate skill and tact as a diplomat. He also helped Secretary Kellogg represent the United States at the Pan-American Conference on Conciliation and Arbitration in December.

Dwight F. Morrow. — By his straightforward sincerity and common sense, Ambassador Morrow won the confidence of President Calles of Mexico, and succeeded in clearing up the atmosphere in the Mexican situation. The signing in March of "regulations" favorable to American oil claims is considered as in large part his personal achievement. His success has marked him as one of the outstanding diplomats of the generation.

Franklin D. Roosevelt.—Out of the Democratic defeat comes one man with enhanced prestige. Mr. Roosevelt was elected Governor of New York at the same time that Governor Smith lost the state's electoral votes. His integrity, ability, culture, charm and anti-Tammany past make him popular in the South as well as in New York. He has been prominently suggested as, at present, the most "available" man for the Democratic nomination in 1932.

THE PROHIBITION CONTROVERSY

By Irving Fisher

Professor of Economics, Yale University

PROHIBITION IN THE NATIONAL CAMPAIGN

Prohibition "Waves."—The presidential campaign also marked the culmination of the ten years' controversy over the Eighteenth Amendment. The issue had been frankly projected into the campaign by the opponents of

prohibition. The Moderation League, Inc., of New York, computed at less than ten years the average length of successive "waves" of prohibition from 1846 to 1918, which ended in its repeal by many states at the close of each wave. The League concluded that election day in November, 1928, would "mark the tenth anniversary of the peak of the prohibition wave (Nov. 5, 1918) in this country," and added: "This indicates that any party which places its reliance in 1928 on the former dry majorities, is almost sure to be disillusioned." Senator Bruce of Maryland, stalwart wet, in a Senate speech on March 4th argued that "we can never win this fight except in a presidential campaign, for at no other time are the voters sufficiently interested to make a real fight. The Democrats must have a wet candidate and a wet platform. . . ."

Party Platforms.—A stiff fight at the Kansas City and Houston conventions of the two major parties resulted in bone-dry enforcement platforms. But at Houston Senator Bruce's advice was taken to the extent of nominating Alfred E. Smith of New York for the Presidency. After his nomination Gov. Smith telegraphed to the chairman of the Convention: "It is well known that I believe there should be fundamental changes in the present provisions for national prohibition. . . . I feel it to be the duty of the chosen leader of the people to point the way which, in his opinion, leads to a sane, sensible solution of a condition which, I am convinced, is entirely unsatisfactory to the great mass of our people. . . . I am satisfied that without returning to the old evils that grew from the saloon, which years ago I held, and still hold, was and ought always to be a defunct institution in this country, by the application of the democratic principles of local self-government and states' rights, we can secure real temperance, respect for law and eradication of existing evils."

Protest of Dry Democrats.—The dry leaders immediately issued a call to southern dry Democrats to convene during July at Asheville, N. C., to "organize at once for the election of dry Democratic senatorial, congressional and state nominees for public office and for the defeat of the wet Tammany candidate for President." To this Dr. F. Scott McBride, Superintendent for the Anti-Saloon League of America, added a statement declaring that, since the program of the Association Against the Prohibition Amendment had been rejected by both parties, which had gone on record in behalf of vigorous and effective enforcement, the issue had narrowed to "one of candidates." He announced that the dry forces would meet the challenge presented by Governor Smith in his telegram.

ATTITUDE OF THE DEMOCRATIC ORGANIZATION

National Democratic Committee.—John J. Raskob, vice-chairman of the Association Against the Prohibition Amendment, was elected chairman of the Democratic National Committee as the choice of Gov. Smith. Mr. Raskob resigned from his chairmanship of the Finance Committee of the General Motors Corporation to take this post, while Pierre S. DuPont, chairman of the Association Against the Prohibition Amendment, obtained leave of absence from the chairmanship of General Motors to aid the Smith campaign. On the day following his election to the Democratic chairmanship, Mr. Raskob issued a statement to the press that he had accepted it as "an opportunity of performing some constructive service by helping relieve the country of the damnable affliction of Prohibition."

The Candidate's Utterance.—In his speech, accepting the presidential nomination, Gov. Smith said: "I shall to the very limit execute the pledge of our platform 'to make an honest endeavor to enforce the Eighteenth Amendment and all other provisions of the Federal Constitution and all laws enacted pursuant thereto.'" To this he added that "opinion upon prohibition cuts squarely across the two great political parties"; that there were "thousands of so-called 'wets and drys' in each," and that he personally believed in a change in

the law, about which the platform was silent. He would therefore lay his recommendations for a change before the Congress. He then described his plan as follows: "Some immediate relief would come from an amendment to the Volstead law giving a scientific definition of the alcoholic content of an intoxicating beverage. The present definition is admittedly inaccurate and unscientific. Each state would then be allowed to fix its own standard of alcoholic content, subject always to the proviso that that standard could not exceed the maximum fixed by the Congress.

"I believe, moreover . . . in an amendment in the Eighteenth Amendment which would give to each individual state itself, only after approval by a referendum popular vote of its people, the right wholly within its borders to import, manufacture or cause to be manufactured, and sell alcoholic beverages, the sale to be made only by the state itself and not for consumption in any public place. We may well learn from the experience of other nations. Our Canadian neighbors have gone far in this manner to solve this problem by the method of sale made by the state itself and not by private individuals. . . . Such a method would continue to make interstate shipment of intoxicating beverages a crime. It would preserve for the dry states Federal enforcement of prohibition within their own borders. It would permit to citizens of other states a carefully limited and controlled method of effectuating the popular will wholly within the borders of those states without the old evil of the saloon."

Mr. Smith went still further in his speech at Milwaukee, Sept. 29, which, in the version that appeared in the press, declared: "What we lack in this country is leadership; and if I am elected President of the United States it will be my duty to lay this matter before every community that I can reach and let them make their own decision. . . . The Republican Party is helpless. Its record makes no appeal. A sane, sensible solution can only come from a Democratic victory, because the Democratic Party will give this matter its frank and fearless attention and lay it before the American people as it has never been laid before them."

Schisms in Democratic Ranks.—Henry Morgenthau, returning from Europe as vice-chairman of the National Democratic Finance Committee, declared that prohibition would be the paramount issue. "There are other important issues," he said, "but this is the one around which the battle will center." Bitter antagonisms in the southern and western wings of the Democratic Party were manifest several months before the nomination of Smith. William G. McAdoo, whose rivalry for the Presidential nomination had occasioned a deadlock with Smith in 1924, spoke for the dry wings at Richmond, Va., Feb. 1, as follows: "An attempt is being made to convince the country that, no matter if a wet is elected President, the Constitution and laws will be enforced. This is both unsound and untrue. The White House in the hands of the liquor interests would be a veritable Gibraltar of offensive operations, and the doom of the Eighteenth Amendment would be written boldly upon the face of the Constitution."

Views of Party Leaders.—In similar vein, after the nomination of Smith the Asheville Conference of Dry Anti-Smith Democrats, July 19, pledged itself to his defeat because of his "repudiation of the Houston platform on Prohibition," and his "selection of a wet Republican as chairman of the National Democratic Committee." Josephus Daniels, dry leader of North Carolina, though "regular," complained that the appointment of Raskob had been made with "no consideration to the large element in the party which, while regular, will not sacrifice its resolve to block any and every attempt by Smith, Raskob or anybody else to beat a retreat on Prohibition."

ANALYSIS OF PRESIDENTIAL VOTE

The Dry States.—The permanence of this rift in the Democratic ranks was revealed by the Republican sweep in November which carried nearly half

the Solid South and elected Herbert Hoover. An analysis of the vote, published Nov. 25, compared with that in 1924, arranged the forty-eight states in the descending order of their Republican strength in 1924. This showed that Maine was the only dry state which evidenced a swing toward the Democratic Party, as compared with the vote for Davis in 1924; it was a small swing, and far from enough to give to Smith Maine's electoral vote. Most of the other distinctly dry states showed big swings toward the Republican Party, as compared with 1924. In this list were Kansas, South Dakota, Washington, Oregon, Wyoming, New Mexico, Nebraska, North Dakota, Idaho, Tennessee, Alabama, Texas, Georgia, and Mississippi. Lesser swings toward Hoover were found in the dry States of Colorado, Ohio, California, Indiana, Iowa, Minnesota, West Virginia, Utah, and South Carolina. Thus nearly all the dry States swung toward Hoover far enough to be carried for him without committing themselves indefinitely to the Republican party.

The Wet States.—Most of the distinctly wet states swung toward Smith; namely, Massachusetts, Rhode Island, and New Jersey. Wet Maryland, the only State which has never had a State enforcement act, Connecticut, and wet New York swung toward Hoover, as did also the wet States of Montana, Wisconsin, Delaware, Missouri, and Louisiana. Vermont and Michigan, both swinging toward Smith, remain unclassified.

OTHER INFLUENCES ON THE ELECTION

Religion.—No doubt the issue of prosperity was potent for Hoover's election, as was also the religious issue. The fourteen states where the recorded majority of church members are Catholics swung toward Smith; of thirty-two states classed as Protestant, in comparison with 1924, thirty swung toward Hoover and two toward Smith.

Votes of Women.—Another influence leading to Hoover's election, apart from the religious and prosperity issues, seemed to be the much keener interest in the issues than ever before, and the swelling of the registration to unprecedented figures. The great majority of women were intent chiefly on saving Prohibition, but they also gave their support to Hoover, the executive who enlisted their cooperation in food conservation during the war.

The Dry Plank.—The country's dry sentiment also showed itself in the revolt of many Democrats against Smith, especially because of his apparent repudiation of the dry plank at Houston. Former Governor Sweet was active in winning Democrats to Hoover in Colorado, ex-Senator Owen in Oklahoma, Senator Simmons in North Carolina, Senator Heflin in Alabama, and Bishop Cannon throughout the South.

ATTITUDE OF THE REPUBLICAN PARTY

The Hoover Pledge. — By many prohibitionists the overwhelming majority given to President-elect Hoover seemed a mandate according to the enforcement plank of his platform. They recalled the statement made by him at Palo Alto, Calif., Aug. 11, as follows: "I do not favor the repeal of the Eighteenth Amendment; I stand for the efficient enforcement of the laws enacted thereunder. Whoever is chosen President has under his oath the solemn duty to pursue this course. Our country has deliberately undertaken a great social and economic experiment, noble in motive and far-reaching in purpose. It must be worked out constructively.

"Common sense compels us to realize that grave abuses have occurred, —abuses which must be remedied. An organized, searching investigation of fact and causes can alone determine the wise method of correcting them. Crime and disobedience of law cannot be permitted to break down the Constitution and laws of the United States.

"Modification of the enforcement laws which permit that which the Constitution forbids is nullification. This the American people will not

countenance. Change in the Constitution can and must be brought about only by the straightforward methods provided in the Constitution itself. There are those who do not believe in the purposes of several provisions of the Constitution. No one denies their right to seek to amend it. They are not subject to criticism for asserting that right. But the Republican Party does deny the right of any one to seek to destroy the purposes of the Constitution by indirection.

"Whoever is elected President takes an oath not only to execute faithfully the office of the President, but that oath provides still further that he will, to the best of his ability, preserve, protect and defend the Constitution of the United States. I should be untrue to these great traditions, untrue to my oath of office, were I to declare otherwise. . . . It lies in our magnificent educational system, in the hard-working character of our people, in the capacity for far-sighted leadership in industry, the ingenuity, the daring of the pioneers of new inventions, in the abolition of the saloon, and the wisdom of our national policies."

DIFFICULTIES OF PROHIBITION ENFORCEMENT

The Commissioner's View.—Dr. James M. Doran, United States Prohibition Commissioner, stated before a Congressional committee, Dec. 5, that the Prohibition Bureau and other governmental agencies were doing a "pretty creditable job" with respect to enforcement, but added: "If Congress wants to embark in the police business it will take $300,000,000 a year and a system of United States courts covering the land." Hence Dr. Doran favored local enforcement by the police, along with adherence to the Federal policy of prosecuting the national conspiracies and of cutting off the main supplies of illicit liquor at the source.

With respect to smuggled liquors, he said: "Notwithstanding the fact that the Coast Guard has broken up nearby rum rows, there is still a large movement from European ports, from the French island of St. Pierre, and from some Central American and Mexican ports into the United States."

The largest quantity of smuggled liquor, the Commissioner stated, moved from Canada, probably seven-eighths of it through the Detroit gateway. He added: "Our State Department has before the government of Canada a request for a conference to make a revision of the treaty. The Canadian hole could be stopped if Canada would refuse clearance to ships carrying liquor obviously intended for delivery in the United States."

Alcohol Production and Allocation.—Commissioner Doran's report for the fiscal year, published Dec. 8, stated that proof gallons of alcohol produced were more than fifteen million gallons less than during the preceding year; that the program of allocation had been of "great benefit to the alcohol industry and the trade by preventing an overproduction of alcohol and avoiding unstable conditions in the trade in regard to their raw material."

Appropriations.—The offhand suggestion by Commissioner Doran that a complete policing of the country by Federal forces would require $300,000,000 gave opportunity for an amendment offered by Senator Bruce of Maryland, to the Conference recommendation of $13,500,000 for enforcement during 1929-1930, increasing it by $270,627,000. By a margin of three votes in the Senate the amendment was defeated, Dec. 17. Next day the House adopted the original report, including $19,000,000 for Coast Guard work, or $32,000,000 in all. This compares with $28,000,000 appropriated for in 1928-1929.

RELATION OF PROHIBITION TO VICE AND CRIME

Night Clubs and Speakeasies.—The Committee of Fourteen of New York, devoted to a study of vice, said in its annual report, July 19: "It is believed that the night club and speakeasy have been directly responsible for a marked increase in the volume of vice. This is especially true, because they provide a place for op-

erations. No similar places have existed since the days of the Raines law hotel and the saloon with back rooms. The Committee of Fourteen, with the assistance of the Brewers' Board of Trade, the bonding companies and the Police Department, completely suppressed the Raines law hotels long before the Federal Prohibition Act was passed. The coöperation which previously existed with the brewers and bonding companies is, of course, impossible now. The police and the committee must face the problem without these important auxiliaries."

Bootleg Crimes. — Referring to crimes incident to prohibition, Silas Hardy Strawn, retiring President of the American Bar Association, said in August: "Crimes of violence, especially in urban centers, committed largely by bootleggers and beer runners, have increased to an alarming extent. It is asserted that the existing condition conduces to a growing disregard of all law, especially by our young people, to an extent that is appalling. Frequently we read of policemen and law-enforcing officials being bribed and debauched and of innocent victims being shot down by overzealous officers in their efforts to enforce the Volstead act."

Arrests and Convictions.—On account of liquor violations, the annual report of the Prohibition Commissioner states that Federal agents made 75,307 arrests during the fiscal year, and seized 6,934 automobiles, valued at $3,057,132, and 81 boats, valued at $144,240. Cases against 77,799 individuals were terminated in Federal courts, with 58,813 convictions, of which 17,793 received jail sentences aggregating 5,631 years, while fines amounted to $7,031,107. Total prohibition cases, as reported by Assistant Attorney General John Marshall, rose to 55,729, or 15,000 above 1927; while all criminal and civil cases in the Federal courts increased only 12,000 to 104,067.

Crime Comparisons.—An unfavorable comparison with respect to increase of crimes and relative decrease of convictions between the United States and England was made, Feb. 27, by the Committee on Inefficiency of Police and Courts of the National Crime Commission. Slack enforcement of the laws against murder, robbery, and other felonies was shown in this pronouncement. It said: "Robbery in Buffalo, for example, must be a particularly lucrative calling. As arrests are made in only 3 per cent of cases, the number who are finally convicted is necessarily so small that the luckless individual who is occasionally caught and convicted must attribute his misfortune to an act of God, as he would in case of disastrous storm, shipwreck or earthquake. . . . The combined figures on manslaughter and murder show 82 per cent of arrests, as compared to crime reported in England. The same figures for St. Louis are only 16 per cent, for Kansas City 36 per cent, and for Baltimore 68 per cent. Cleveland, which has the high-water mark of efficiency on these crimes, averaged 83 per cent, or 1 per cent more than in England. However, on robbery Cleveland has a record of 49 per cent, as compared to 80 per cent in England."

RELATION TO HEALTH AND MORALITY

Public Health Summary. — The most recent authoritative summary of direct and indirect effects of prohibition on public health is that of Haven Emerson, M.D., formerly President of the Board of Health of New York. In the *Survey Graphic* for December, Dr. Emerson said:

"1. The death rate from alcoholism fell to 19 per cent of the pre-prohibition rate, and in spite of subsequent rises the rate is now less than 75 per cent of the pre-prohibition rate. Only in the States of New York, New Jersey, Pennsylvania, and Maryland, where the violations of the law have been most flagrant and public opinion strongly pro-alcohol, has the death rate from alcoholism in any single year since the pre-prohibition era equaled the average rate of the last seven pre-prohibition years.

"2. The death rate from cirrhosis of the liver fell to 54.3 per cent and has never been nearer than 57.4 per cent of the pre-prohibition rate.

"3. The general death rate (all ages, all causes) has for the entire post-prohibition period been at a lower level than in any single year before prohibition.

"4. The reduction in the general death rate has been more marked for women up to

thirty-five and for both sexes under twenty, than for the population as a whole.

"5. The tuberculosis death rate has fallen at all ages and for both sexes and for both whites and Negroes faster than for any previous period.

"6. Admissions to mental-disease hospitals for alcoholic psychoses have been at a lower rate in proportion to all admissions since prohibition than for any previous similar period of time.

"7. There has been apparently a reduction in the incidence of cases of drug addiction, coming under hospital care, at the same time that there has been a reduction in hospital admissions for acute alcoholism.

"8. There has been an actual increase (in terms of the value of the dollar in 1913) in the savings, insurance policies and assets of building-and-loan associations per capita of the population, at a rate not previously experienced.

"9. There has been less delinquency from alcoholism.

"10. There have been fewer crimes against chastity.

"11. There has been less brutality to and neglect of children in their homes because of alcoholism.

"12. A smaller fraction of all material relief is now needed because of alcoholism as a cause of dependency.

"13. There has been an increase in the proportion of all children who have continued in school beyond the minimum grades required by law.

"14. A large proportion of the commercial, philanthropic, state and other institutions for the care of alcoholic patients have been closed since prohibition.

"15. The condition of the aged and infirm in county and other poor farms have improved and the mean ages of almshouse inmates have increased from forty-four to sixty-six years among men and from thirty-three to sixty-one among women inmates.

"16. There has been an increase in the per capita consumption of milk and milk products at a faster rate than during any similar period before prohibition."

Living Standards Raised. — Dr. Emerson says further: "Better housing, clothing, and food have been obtained for the people of the lower income levels. What part prohibition has played in this prosperity and its accompanying improvement in family well-being and health cannot be statistically presented, but that the outlawing of the liquor traffic has been an element in diverting earnings and savings to more beneficial objectives than the purchase of alcoholic drinks is universally accepted."

DURANT PRIZE PLAN

Among prominent industrialists who indicated a preference during the Presidential campaign for a continuance of national prohibition, W. C. Durant, President of Durant Motors, Inc., offered a prize of $25,000 for the best and most practicable plan to make the Eighteenth Amendment effective. He said:

"Big business leaders who have the largest stake in law observance publicly and privately violate this law and countenance its violation by others. Instead of using their wealth and influence to create public opinion demanding law enforcement, our business men of character and position are the chief support of the master criminal class, the bootlegger. It is not surprising that the flagrant example of lawlessness on the part of the men highest in their communities has undermined respect for law in their children, their servants, their employees and all classes of citizens, including public officials and judges. When thinking men generally come to realize that the responsibility is up to them to take the initiative in law observance, then, and not until then, will the Eighteenth Amendment be given fair trial."

The award for the winning plan was made on Christmas Day to Major Chester P. Mills, formerly Federal Prohibition Administrator for the New York District. It presented in detail his method of preventing the diversion of industrial alcohol at its source, which Major Mills put into operation during his sixteen-month term ended June 27, 1927. The competition resulted in the participation of 23,230 persons from every state and territorial possession of the United States. At the same time a prize of $5,000 was awarded to Malcolm D. Almack, representing the Palo Alto, (Calif.) High School, for the best plan presented by a high school. Mr. Durant later suggested that he would gladly turn over to a Congressional investigating committee the "rich material in the files of the prize contest."

ELECTIONS OF 1928

By Thomas N. Hoover

Professor, Ohio University

THE PRESIDENTIAL ELECTION

The Presidential election was by far the center of attraction in the 1928 campaign, however important other elections may have been. The following tabulation gives the popular vote cast by states for Herbert Hoover and Alfred E. Smith:

ELECTORAL AND POPULAR VOTES FOR PRESIDENT, 1928

State	Electors	Hoover (Rep.)	Smith (Dem.)
Ala.	12	120,725	127,796
Ariz.	3	52,533	38,537
Ark.	9	77,751	119,196
Cal.	13	1,162,328	614,356
Colo.	6	252,872	133,131
Conn.	7	296,614	252,040
Del.	3	68,860	35,354
Fla.	6	144,168	100,721
Ga.	14	99,369	129,602
Idaho	4	97,322	52,926
Ill.	29	1,769,141	1,313,817
Ind.	15	848,290	562,691
Iowa	13	623,818	378,936
Kans.	10	513,672	193,003
Ky.	13	558,064	381,070
La.	10	51,160	164,655
Maine	6	179,923	81,179
Md.	8	301,479	223,626
Mass.	18	775,566	792,758
Mich.	15	965,396	396,762
Minn.	12	560,977	396,451
Miss.	10	26,899	124,539
Mo.	18	834,080	662,076
Mont.	4	113,300	78,578
Nebr.	8	345,745	197,959
Nev.	3	18,327	14,090
N. H.	4	115,404	80,715
N. J.	14	925,796	616,517
N. Mex.	3	69,617	48,094
N. Y.	45	2,193,344	2,089,863
N. C.	12	348,683	286,744
N. Dak.	5	131,441	106,648
Ohio	24	1,627,543	864,210
Okla.	10	394,052	219,206
Oreg.	5	205,341	109,223
Pa.	38	2,055,382	1,067,586
R. I.	5	117,522	118,973
S. C.	9	5,838	62,700
S. Dak.	5	157,603	102,660
Tenn.	12	195,388	157,343
Texas	20	367,036	339,013
Utah	4	94,485	80,985
Vt.	4	90,404	44,440
Va.	12	164,609	140,146
Wash.	7	335,503	156,772
W. Va.	8	375,551	263,784
Wis.	13	544,205	450,259
Wyo.	3	52,748	29,299

The following were the candidates and total votes of the other political parties:

Thomas, Socialist, with a total popular vote of 267,835, and no electoral votes. Of the popular votes, 107,332 were cast in New York; 19,595 in California; 19,138 in Illinois; 18,647 in Pennsylvania; 18,213 in Wisconsin. In no other state were there as many as 10,000.

Foster, Worker's Party, received no electoral votes and a popular vote of 48,228. In New York alone did he receive as many as 10,000 votes.

Reynolds, Socialist-Labor, received 21,181 popular votes, and no electoral votes. In no state did he receive as many as 5,000 votes.

Varney, Prohibition, received 20,101 votes, most of which were cast in Indiana, Pennsylvania, Ohio and Wisconsin.

Webb, Farmer-Labor, received a total of 6,391 votes.

In tabulating the popular votes for President, the general plan has been to take the highest vote cast for elector on the ticket. In many cases, the Secretary of State has sent but one vote for the state.

THE SENATE

There were thirty-seven senators to be elceted in 1928, two states, Ohio and New Mexico, each having two to elect. The result was the election of twenty-four Republicans, twelve Democrats, and one Farmer-Labor. The Senate will be made up of fifty-five Republicans, thirty-nine Democrats, one Farmer-Labor. There is still a vacancy from Pennsylvania, pending the adjustment of the Vare contest of 1926. The Republicans will thus have a more comfortable majority than they had in the preceding Congress.

The independence of the voter is again seen from the election. Arizona, Florida, Montana, Nevada, New York, Tennessee, Texas, Utah, Virginia, and Wyoming, Republican in the presidential election, elected Democratic senators. Minnesota elected Republican electors and a Farmer-Labor Sen-

ator. Rhode Island elected a Republican Senator, but went Democratic in the Presidential contest.

HOUSE OF REPRESENTATIVES

The great Republican wave swept members of the Democrats out of the lower house, giving the Republicans a large majority in the 70th Congress. A study of the statistics disclose great inequality in the number of votes cast in different congressional districts.

In the sixth Michigan district, 327,978 votes were cast. In the seventh Illinois were 284,380 votes. The tenth district of Missouri had a vote of 298,407. Several others had votes in excess of 200,000. On the other hand, many districts had fewer than 30,000 votes. In but one district in South Carolina was a vote returned in excess of 10,000.

Three new women members will be found in the next Congress. These are Mrs. Ruth Bryan Owen, of Florida, daughter of the late William Jennings Bryan; Mrs. Ruth Hanna McCormick of Illinois, daughter of the late Mark Hanna; and Mrs. Ruth Pratt, of New York. The four women to be reëlected were: Mrs. Mary Norton of New Jersey; Mrs. Edith Nourse Rogers of Massachusetts; Mrs. Katherine Langley of Kentucky; and Mrs. Florence Kahn of California.

From the first Illinois district, Oscar De Priest will be a member, the first negro elected since 1901.

GOVERNORS

Governors were elected in Colorado, Florida, Montana, North Carolina, South Dakota, Tennessee, Texas and Utah, states that supported Herbert Hoover for President. Rhode Island elected a Republican governor, but elected Democratic presidential electors. Sixteen governors were reëlected. In all, there were twenty-four Republican and eleven Democratic governors elected.

STATE CONSTITUTIONAL QUESTIONS

There were ten proposals voted on in Arizona. The Medical Liberty Amendment, Peddler's License tax law, School Bond Expense, Physical Education, Repeal of Motor Vehicle Law, State Board of Equalization, Commissioner of State Finance, and Motor Vehicle Department proposals were rejected. Tax exemption for widows, etc., and repeal of Fish and Game law were carried.

Ohio rejected an amendment relative to the salaries of Judges. In Maryland an amendment relative to the compensation of members of the General Assembly was defeated. Seven amendments were adopted in Idaho, one of which fixed the term of state elective officials at four years. One amendment to limit pay to members of state legislature to $10 per day was rejected. Kansas adopted two amendment, one relating to highways, the other to motor vehicle and fuel tax. Three amendments were adopted in Rhode Island: Biennial Registration, Composition of the State Senate, and Abolition of Property qualifications. Three loans were also authorized. North Carolina rejected amendments providing for Solicitorial Districts, and classification of intangible property. The amendment fixing salaries was approved. Two amendments were accepted in West Virginia; one providing for a sixty-day session of the legislature, and the other for a $35,000,000 road bond. South Carolina adopted an amendment permitting a five-year exemption from taxation to new manufacturing enterprises.

North Dakota refused to abolish the Guarantee of Deposits Provision. Maine adopted an excise tax on railroads by a vote of 119,762 for, and 52.350 against it. In Illinois the Fishing and Hunting Grounds Proposal was rejected.

Twenty-two local amendments were submitted, all of which were approved.

Fourteen amendments were voted on in Pennsylvania, only four of which were approved. Of these, one provided for voting machines. In Louisiana, eighteen amendments were submitted, all of which were approved. In Texas, four amendments were added, providing for aid to confederates, exemption of certain property for taxation, six-year terms for school officials, and a state board of

education. In Washington, a taxation amendment was rejected. Three amendments were approved in Michigan, one for representation, one relative to Eminent Domain, and one for compensation of members of the legislature. The voters of Iowa approved two amendments, one relating to senatorial districts, the other for a road bond measure. The amendment proposed in Nebraska was approved. Two amendments to the Missouri Constitution, to increase pay, and police pension were rejected. One for Highway Bonds was approved. Oregon rejected all of the eight proposals submitted, including a five cent gasoline tax bill, and an income tax bill.

ELECTION STATISTICS FOR 1928

By Thomas N. Hoover

Professor, Ohio University

ARIZONA

Governor	
John C. Phillips, Rep.	47,829
George W. P. Hunt, Dem.	44,553
U. S. Senator	
Ralph H. Cameron, Rep.	39,651
Henry F. Ashurst, Dem.	47,031
U. S. Representatives	
Guy Axline, Rep.	31,382
L. W. Douglas, Dem.	50,231

ARKANSAS

Governor	
—— Bowers, Rep.	44,565
—— Parnell, Dem.	151,771
U. S. Representatives	
1. S. E. Simonson, Rep.	4,770
W. J. Driver, Dem.	24,824
2. J. L. McKarney, Rep.	5,471
W. A. Oldfield, Dem.	18,772
3. Sam B. Cecil, Rep.	13,129
C. A. Fuller, Dem.	18,157
4. G. W. Johnson, Rep.	7,308
Otis Wingo, Dem.	20,962
5. Lonzo A. Ross, Rep.	7,140
Heartsell Ragon, Dem.	25,553
6. D. D. Glover, Dem.	28,001
7. Pat McNally, Rep.	4,757
Tillman B. Parks, Dem.	20,954

COLORADO

Governor	
Wm. L. Boatright, Rep.	136,207
Wm. H. Adams, Dem.	235,712
U. S. Representatives	
1. Wm. R. Eaton, Rep.	63,258
S. H. White, Dem.	44,713
Wm. Dietrich, W-C.	949
2. C. B. Timberlake, Rep.	62,373
Earle E. House, Dem.	31,480
3. Guy U. Hardy, Rep.	64,116
Harry A. McIntyre, Dem.	34,670
4. Wm. P. Dale, Rep.	21,089
Edward T. Taylor, Dem.	30,142

CONNECTICUT

Governor	
John H. Trumbull, Rep.	296,216
—— Morris, Dem.	252,209
—— McLevy, Soc.	3,184
U. S. Senator	
—— Walcott, Rep.	296,958
—— Lonergan, Dem.	251,429
—— Plunket, Soc.	3,014
U. S. Representatives	
1. —— Fenn, Rep.	75,743
—— Koppleman, Dem.	65,922
—— Mansur, Soc.	777
2. —— Freeman, Rep.	48,590
—— Citron, Dem.	37,786
—— Boardman, Soc.	424
3. —— Tilson, Rep.	58,337
—— Moseley, Dem.	52,358
—— Davis, Soc.	791
4. —— Merritt, Rep.	71,649
—— Sunderland, Dem.	55,106
—— Moffatt, Soc.	718
5. —— Glynn, Rep.	43,332
—— Mascolo, Dem.	39,354

DELAWARE

Governor	
Clayton D. Buck, Rep.	63,683
Charles M. Wharton, Dem.	40,824

FLORIDA

Governor	
W. J. Howey, Rep.	95,018
Doyle E. Carlton, Dem.	148,455
U. S. Senator	
Barclay H. Warburton, Rep.	70,633
Park Trammell, Dem.	153,816
U. S. Representatives	
1. Abner B. Brown, Rep.	29,871
Herbert J. Drane, Dem.	42,003
2. Thomas P. Chaires, Rep.	3,310
R. A. Green, Dem.	17,228
3. Tom A. Yon, Dem.	22,167
4. Wm. C. Lawson, Rep.	36,228
Ruth Bryan Owen, Dem.	67,130

IDAHO

Governor	
H. C. Baldridge, Rep.	87,681
—— Ross, Dem.	63,046
—— Coonrod, Soc.	908
U. S. Senator	
—— Thomas, Rep.	90,922
—— Clark, Dem.	53,399
—— Lundt, Soc.	1,016
U. S. Representatives	
1. Burton L. French, Rep.	43,770
—— Tyler, Dem.	19,064
—— Nelson, Soc.	677
2. Addison T. Smith, Rep.	53,236
—— Harding, Dem.	29,422
—— Hibner, Soc.	362

ILLINOIS

Governor

Louis L. Emmerson, Rep. ..	1,709,818
Floyd E. Thompson, Dem.	1,284,897
Geo. Koop, Soc.	12,974

U. S. Senator

Otis F. Glenn, Rep.	1,594,031
A. J. Cermak, Dem.	1,315,338
G. R. Kirkpatrick, Soc.	13,002

U. S. Representatives

At Large

Ruth Hanna McCormick, Rep.	1,709,348
Chas. F. Brown, Dem.	1,171,520
Florence Kilpatrick, Soc. ..	11,958
Richard Yates, Rep.	1,673,962
C. D. Joplin, Dem.	1,111,253
J. E. Mahoney, Soc.	11,538
1. Oscar De Priest, Rep.	24,479
Harry Baker, Dem.	20,664
2. Morton D. Hull, Rep.	126,005
M. C. Walsh, Dem.	76,909
3. Elliot W. Sproul, Rep.	101,384
Henry P. Bergen, Dem.	95,999
4. E. J. Zelezinski, Rep.	22,741
Thomas A. Doyle, Dem. ...	40,940
5. E. J. Gates, Rep.	10,799
Adolph J. Sabath, Dem. ...	25,225
6. S. L. Golan, Rep.	94,941
James T. Igoe, Dem.	143,989
7. M. A. Michaelson, Rep.	164,447
Emil Selten, Dem.	119,933
8. Edward Walz, Rep.	10,110
Stanley H. Kunz, Dem.	24,517
9. Fred A. Britten, Rep.	43,394
J. T. McDermott, Dem.	26,450
10. Carl R. Chindbloom, Rep.	138,386
J. A. Weber, Dem.	82,598
11. Frank R. Reid, Rep.	97,938
E. L. Wilson, Dem.	44,306
12. John T. Buckbee, Rep.	82,938
Jules Vallatt, Dem.	29,385
13. Wm. R. Johnson, Rep.	53,985
Wm. G. Curtis, Dem.	19,209
14. John C. Allen, Rep.	53,680
Wm. H. Artzell, Dem.	29,768
15. Edward J. King, Rep.	57,284
James H. Andrews, Dem. ..	31,944
16. Wm. E. Hull, Rep.	59,190
Geo. H. Rickenberger, Dem.	37,662
17. Homer W. Hall, Rep.	47,266
Frank Gillespie, Dem.	25,480
18. Wm. P. Holaday, Rep.	57,373
James H. Elliott, Dem. ...	35,213
19. Chas. Adkins, Rep.	73,243
W. W. Reeves, Dem.	37,358
20. E. T. Hunter, Rep.	30,100
Henry T. Rainer, Dem.	38,409
21. Frank M. Ramey, Rep.	52,320
J. Earl Major, Dem.	52,183
22. Ed. M. Irwin, Rep.	72,448
Eugene W. Kreitner, Dem.	56,825
23. C. T. Wade, Rep.	42,263
Wm. W. Arnold, Dem.	49,378
24. Thomas S. Williams, Rep.	36,239
Val B. Campbell, Dem.	25,773
25. Edward E. Denison, Rep. ..	51,025
A. F. Gourley, Dem.	42,799

INDIANA

Governor

Harry G. Leslie, Rep.	728,203
Frank C. Dailey, Dem.	683,545
Albert Stanley, Pro.	5,096

U. S. Senator

Arthur R. Robinson, Rep. ..	782,144
Albert Stump, Dem.	623,996
W. H. Harris, Pro.	4,033

U. S. Representatives

1. Harry E. Rowbottom, Rep.	49,013
John W. Boehne, Dem.	47,404
2. Orville T. Stout, Rep.	449,941
A. H. Greenwood, Dem. ...	45,901
J. B. Garten, Soc.	688
3. Jas. W. Dunbar, Rep.	47,768
Frank Gardner, Dem.	45,718
4. Chas. S. Hisey, Rep.	40,345
Harry C. Canfield, Dem. ...	44,671
5. Noble J. Johnson, Rep. ...	51,138
H. W. Moore, Dem.	39,538
Donald C. Adams, Soc.	562
6. Richard M. Elliott, Rep. ..	50,795
W. H. Larrabee, Dem.	38,326
7. Ralph E. Updike, Rep.	88,263
Louis Ludlow, Dem.	94,643
E. M. Lentz, Pro.	828
8. Albert H. Vestal, Rep.	59,704
Don. C. Ward, Dem.	42,645
9. Fred S. Purnell, Rep.	53,998
G. L. MacKintosh, Dem. ...	40,357
10. Wm. R. Wood, Rep.	87,972
J. W. Sobraske, Dem.	53,874
11. Albert R. Hall, Rep.	49,326
M. C. Townsend, Dem.	41,836
12. David Hogg, Rep.	56,436
S. D. Jackson, Dem.	45,592
13. Andrew Hickey, Rep.	90,618
Chester A. Perkins, Dem. ..	60,993

IOWA

U. S. Representatives

1. W. F. Kopp, Rep.	45,806
2. F. D. Letts, Rep.	49,690
Frank C. Titzell, Dem.	37,344
3. T. J. B. Robinson, Rep. ...	60,025
L. F. Tierney, Dem.	38,469
4. Gilbert N. Haugen, Rep. ...	50,488
Erwin Larson, Dem.	31,968
5. Cyrenus Cole, Rep.	54,703
Maurice Cahill, Dem.	27,893
6. C. Ver Ploeg, Rep.	43,259
7. Cassius C. Dowell, Rep. ...	72,404
8. Floyd Thurston, Rep.	43,050
James Pearson, Dem.	28,686
9. Chas. E. Swanson, Rep. ...	47,632
W. J. Burke, Dem.	27,750
10. L. J. Dickenson, Rep.	58,374
11. Ed. H. Campbell, Rep.	69,563
George Finch, Dem.	32,914

KANSAS

Governor

Clyde M. Reed, Rep.	433,391
Chauncey B. Little, Dem. ..	219,327
Henry L. Peterson, Soc. ...	7,924

U. S. Representatives

1. W. P. Lambertson, Rep. ...	48,543
Maurice P. O'Keefe, Dem. ..	22,492
2. U. S. Guyer, Rep.	66,044
Lee R. Hettick, Dem.	28,106
3. W. H. Sproul, Rep.	45,121
J. E. Gaitskill, Dem.	39,323
4. Homer Hock, Rep.	38,664
C. T. Neihart, Dem.	13,450
5. James G. Strong, Rep.	45,053
J. F. Corder, Dem.	19,425
6. Charles I. Sparks, Rep.	41,272
Wm. H. Clark, Dem.	23,836
7. Clifford R. Hope, Rep.	58,001
W. C. Dickey, Dem.	25,433
8. Richard E. Bird, Rep.	32,802
W. A. Ayres, Dem.	46,117

KENTUCKY

U. S. Representatives

1.	Miller Hughes, Rep.	27,581
	W. V. Gregory, Dem.	36,325
2.	Clark MacDonald, Rep.	34,194
	David H. Kincheloe, Dem.	38,093
3.	C. W. Roark, Rep.	37,216
	John W. Moore, Dem.	33,210
4.	J. D. Craddock, Rep.	39,244
	Henry D. Moorman, Dem.	34,639
5.	Maurice H. Thatcher, Rep.	96,926
	Arthur Yager, Dem.	64,201
6.	J. L. Newhall, Rep.	48,009
	Brent Spence, Dem.	42,309
	John J. Thobe, Soc.	113
7.	Robert Blackburn, Rep.	43,604
	Virgil Chapman, Dem.	37,936
8.	Lewis L. Walker, Rep.	33,931
	Ralph Gilbert, Dem.	30,424
9.	Elva R. Kindall, Rep.	51,019
	Fred M. Vinson, Dem.	45,426
10.	Mrs. John W. Langley, Rep.	39,541
	A. J. May, Dem.	30,919
11.	John M. Robsion, Rep.	74,929
	H. F. Reed, Dem.	18,939

LOUISIANA

U. S. Representatives

1.	James O'Connor, Dem.	28,066
2.	I. J. Fletchinger, Rep.	14,661
	J. Z. Spearing, Dem.	33,176
3.	W. P. Martin, Dem.	15,219
4.	J. N. Sandlin, Dem.	14,949
5.	R. J. Wilson, Dem.	11,827
6.	B. E. Kemp, Dem.	18,379
7.	R. L. De Rouen, Dem.	16,582
8.	Jas. B. Aswell, Dem.	14,618

MAINE

Governor

	Wm. Tudor Gardener, Rep.	148,053
	Edward C. Moran, Jr., Dem.	65,672

U. S. Senator

	Frederick Hale, Rep.	145,501
	H. E. Holmes, Dem.	63,429

U. S. Representatives

1.	C. L. Beedy, Rep.	40,255
	E. P. Spinney, Dem.	19,219
2.	W. H. White, Jr., Rep.	36,791
	Albert Beliveau, Dem.	19,420
3.	John E. Nelson, Rep.	36,686
	S. C. C. Ward, Dem.	12,498
4.	D. F. Snow, Rep.	32,223
	C. C. Stevens, Dem.	10,753

MARYLAND

U. S. Senator

	Phillips L. Goldsborough, Rep.	256,224
	Wm. C. Bruce, Dem.	214,447
	Wm. A. Toole, Soc.	2,026

U. S. Representatives

1.	A. S. Marine, Rep.	28,059
	T. A. Goldsborough, Dem.	28,795
2.	L. L. Clark, Rep.	69,267
	Wm. P. Cole, Dem.	59,912
	C. H. Taylor, Soc.	682
3.	T. P. Hill, Rep.	27,047
	V. L. Palmisano, Dem.	27,377
	S. M. Neistadt, Soc.	560
4.	J. P. Brandau, Rep.	34,112
	J. C. Linthicum, Dem.	41,432
	A. F. Anthony, Soc.	543
5.	Oliver Metzerott, Rep.	28,574
	S. W. Gambrill, Dem.	31,403
	G. P. Dill, Soc.	529
6.	F. N. Zihlman, Rep.	47,789
	D. J. Lewis, Dem.	37,179

MASSACHUSETTS

Governor

	Frank G. Allen, Rep.	769,372
	Chas. H. Cole, Dem.	750,137
	Mary Donovan Hapgood, Soc.	7,486

U. S. Senator

	B. L. Young, Rep.	693,563
	David I. Walsh, Dem.	818,055
	A. B. Lewis, Soc.	7,675

U. S. Representatives

1.	Allen T. Treadway, Rep.	51,791
	D. A. Martin, Dem.	41,216
2.	Wm. K. Kaynor, Rep.	52,344
	John D. O'Connor, Dem.	43,856
3.	Frank H. Foss, Rep.	51,145
	Joseph E. Casey, Dem.	34,776
4.	George R. Stobbs, Rep.	51,145
	F. M. Saltus, Dem.	42,115
5.	Edith Nourse Rogers, Rep.	56,004
	C. F. Cronin, Dem.	35,713
6.	A. Piatt Andrews, Rep.	58,293
	Geo. F. Ferguson, Dem.	27,130
7.	Wm. P. Connery, Jr., Rep.	61,697
8.	Frederick Dallinger, Rep.	71,850
	Jas. P. Brennan, Dem.	53,721
9.	Charles L. Underhill, Rep.	48,947
	Arthur D. Healey, Dem.	48,290
10.	Edward L. Donnelly, Rep.	7,498
	John J. Douglas, Dem.	42,594
11.	George H. Tinkham, Rep.	52,576
	Maurice J. Tobin, Dem.	37,514
12.	Herbert W. Burr, Rep.	19,937
	John W. McCormack, Dem.	64,351
13.	Robert Luce, Rep.	74,097
	Thomas Lovelle, Dem.	53,266
14.	Richard B. Wigglesworth, Rep.	73,598
	C. M. Clifford, Dem.	46,498
15.	Joseph W. Martin, Rep.	39,905
	John F. Trainor, Dem.	30,373
16.	Charles L. Gifford, Rep.	49,202
	W. E. Boyden, Dem.	23,590
	Frank J. Manning, Soc.	5,115

MICHIGAN

Governor

	Fred W. Green, Rep.	961,179
	Wm. A. Comstock, Dem.	404,546

U. S. Senator

	Arthur H. Vandenberg, Rep.	977,893
	John W. Bailey, Dem.	376,592

U. S. Representatives

1.	Robert H. Clancey, Rep.	64,606
	W. M. Donnelly, Dem.	39,870
	A. Londal, Soc.	262
2.	Earl C. Michener, Rep.	86,804
	G. L. Morden, Dem.	31,223
3.	J. L. Hooper, Rep.	71,650
	W. L. Fitzgerald, Dem.	18,535
4.	J. C. Ketcham, Rep.	60,334
	R. I. Jarvis, Sr., Dem.	19,708
5.	Carl E. Mapes, Rep.	73,241
	F. C. Jarvis, Dem.	19,627
	J. A. Ziegler, W.-C.	111
6.	G. M. Hudson, Rep.	238,223
	A. Bruce Atwell, Dem.	89,085
	M. E. Depew, Soc.	670
7.	Louis C. Cramton, Rep.	61,439
	V. J. Bowers, Dem.	21,659
8.	B. J. Vincent, Rep.	65,600
	B. J. Abbott, Dem.	21,387
9.	J. C. McLaughin, Rep.	51,246
	Ray Recter, W.	96
10.	Roy O. Woodruff, Rep.	43,800
	J. E. Richardson, Dem.	15,598
11.	F. P. Bohn, Rep.	44,546
	C. R. Henry, Dem.	21,760
12.	W. F. James, Rep.	47,069
	L. A. Barry, Dem.	21,039

13. C. J. McLeod, Rep.	70,513
J. S. Hall, Dem.	37,574
Wm. Mollenhane, W.	273

MINNESOTA

Governor	
Theodore Christianson, Rep.	549,857
Andrew Nelson, Dem.	213,734
Ernest Lundeen, F.-L.	227,193
U. S. Senator	
A. E. Nelson, Rep.	342,992
Henrik Shipstead, F. L.	665,169
V. R. Dunne, W.C.	9,380
U. S. Representatives	
1. Victor Christgan, Rep.	59,628
J. F. Lynn, Dem.	32,398
2. Frank Clague, Rep.	60,259
J. A. Cashel, Dem.	26,606
3. A. H. Andresen, Rep.	52,526
C. C. Kolars, Dem.	19,844
Henry Arens, F.-L.	15,749
4. Melvin Joseph Maas, Rep.	39,648
J. P. Dolan, Dem.	31,521
H. V. Williams, F.-L.	23,068
5. Walter H. Newton, Rep.	80,856
James Robertson, Dem.	31,528
Ferdinand Johnson, F.-L.	24,869
6. Harold Knutson, Rep.	55,663
John Knutsen, F.-L.	28,276
7. L. M. Carlson, Rep.	27,735
O. J. Kvale, F.-L.	56,029
8. Wm. A. Pittenger, Rep.	43,777
Dan C. Reed, Dem.	9,784
W. L. Carss, F.-L.	42,508
9. C. G. Selvig, Rep.	45,319
Knud Wefald, F.-L.	36,853
10. G. G. Goodwin, Rep.	60,100
E. W. Erickson, Dem.	22,702
C. R. Hedlund, F.-L.	23,774

MISSISSIPPI

U. S. Senator	
H. D. Stephens, Dem.	111,180
U. S. Representatives	
1. John E. Rankin, Dem.	13,816
2. Wall Doxey, Dem.	12,276
3. W. M. Whittington, Dem.	13,039
4. Jeff Busby, Dem.	13,456
5. Ross A. Collins, Dem.	17,967
6. Robert S. Hall, Dem.	18,206
7. Percy E. Quin, Dem.	12,348
8. J. W. Collier, Dem.	11,442

MISSOURI

Governor	
Henry S. Caulfield, Rep.	784,293
Francis M. Wilson, Dem.	731,783
Joseph G. Hodges, Soc.	2,412
U. S. Senator	
R. C. Patterson, Rep.	787,499
C. M. Hay, Dem.	726,322
Chas. H. Harrison, Soc.	2,845
U. S. Representatives	
1. J. Frank Culler, Rep.	31,751
M. A. Romjue, Dem.	35,702
2. Lloyd V. Harmon, Rep.	33,273
Ralph F. Lozier, Dem.	37,829
3. H. F. Lawrence, Rep.	———
Jacob L. Milligan, Dem.	———
4. Chas. L. Faust, Rep.	43,733
Richard M. Duncan, Dem.	32,892
5. E. C. Ellis, Rep.	113,043
Floyd E. Jacobs, Dem.	110,529
Simon Ommerman, Soc.	169
6. Thomas J. Halsey, Rep.	31,557
Clement C. Dickinson, Dem.	26,838
7. John W. Palmer, Rep.	52,317
Sam C. Major, Dem.	45,832
8. David W. Peters, Rep.	26,619
Wm. L. Nelson, Dem.	33,327
9. Aug. H. Sternbeck, Rep.	34,248
Clarence Cannon, Dem.	41,036
10. Henry F. Neidringshaus, Rep.	164,083
11. Wm. Gray, Rep.	32,706
John J. Cochran, Dem.	44,130
12. L. C. Dyer, Rep.	24,701
Joseph L. McLemore, Dem.	17,609
13. Charles E. Kiefner, Rep.	30,535
Clyde Williams, Dem.	29,842
14. Dewey J. Short, Rep.	57,880
James F. Fulbright, Dem.	49,495
15. Joe J. Manlove, Rep.	52,124
George Lang, Dem.	28,551
16. Rowland L. Johnston, Rep.	29,848
S. A. Cunningham, Dem.	25,899

MONTANA

Governor	
W. D. Rankin, Rep.	79,777
J. E. Erickson, Dem.	113,635
W. R. Duncan, Soc.	781
U. S. Senator	
J. M. Dixon, Rep.	91,185
Burton K. Wheeler, Dem.	103,655
U. S. Representatives	
1. M. D. Fitzgarrald, Rep.	32,796
John M. Evans, Dem.	44,618
P. J. Cavanaugh, Soc.	466
2. Scott Leavitt, Rep.	70,682
B. A. Taylor, Dem.	33,051
J. M. Kruse, Soc.	360

NEBRASKA

Governor	
Arthur J. Weaver, Rep.	308,262
Charles W. Bryan, Dem.	230,640
F. P. Haffner, Soc.	2,095
U. S. Senator	
R. B. Howell, Rep.	324,014
R. L. Metcalfe, Dem.	204,737
U. S. Representatives	
1. Elmer J. Burkett, Rep.	38,583
John H. Morehead, Dem.	39,202
2. Willis G. Sears, Rep.	52,801
H. B. Fleharty, Dem.	41,424
3. James Nichols, Rep.	41,967
Edgar Howard, Dem.	60,974
4. Charles H. Sloan, Rep.	37,114
J. N. Norton, Dem.	36,896
5. Fred G. Johnson, Rep.	37,853
A. C. Shellenberger, Dem.	36,283
6. Robert G. Simmons, Rep.	81,581
John McCoy, Dem.	28,215

NEVADA

U. S. Senator	
Samuel Platt, Rep.	13,414
Key Pittman, Dem.	19,515
U. S. Representatives	
Samuel S. Arentz, Rep.	13,815
Chas. Lee Horsey, Dem.	13,287

NEW HAMPSHIRE

Governor	
Chas. W. Tobey, Rep.	108,431
Eaton D. Sargent, Dem.	79,798
U. S. Representatives	
1. Fletcher Hale, Rep.	53,642
F. C. Keefe, Dem.	39,570
2. Edward H. Wason, Rep.	54,642
A. W. Levensaler, Dem.	36,275

NEW JERSEY

Governor	
Morgan F. Larson, Rep.	824,005
Wm. L. Dill, Dem.	671,728
Scott Nearing, W.	1,255

U. S. Senator

Hamilton F. Kean, Rep.	841,752
Edward I. Edwards, Dem.	608,623
Charlotte Bohlin, Soc.	2,267

U. S. Representatives

1. Chas. A. Wolverton, Rep.	109,510
A. R. White, Dem.	36,778
2. Isaac Bacharach, Rep.	99,109
Geo. R. Greis, Dem.	30,856
3. Harold G. Hoffman, Rep.	95,669
John R. Phillips, Jr., Dem.	56,290
4. Chas. A. Eaton, Rep.	65,149
O. J. Turner, Dem.	37,341
5. Ernest R. Ackerman, Rep.	95,458
Roswell S. Nichols, Dem.	46,211
6. Randolph Perkins, Rep.	104,303
Frank E. Sample, Dem.	55,544
7. Geo. N. Seger, Rep.	54,896
Abram Klenert, Dem.	41,012
N. J. Anthony, Soc.	295
8. Fred A. Hartley, Rep.	64,849
Paul J. Moore, Dem.	65,398
9. Franklin A. Fort, Rep.	46,685
F. X. Purcell, Dem.	35,730
J. M. Reilly, Soc.	201
10. Frederick R. Lehlbach, Rep.	74,154
E. J. O'Mara, Dem.	45,287
11. Geo. M. Eichler, Rep.	31,728
O. L. Auf der Heide, Dem.	51,982
12. Philip W. Grece, Rep.	34,817
Mary T. Norton, Dem.	56,748

NEW YORK

Governor

Albert Ottinger, Rep.	2,104,629
Franklin D. Roosevelt, Dem.	2,130,193
Louis Waldman, Soc.	101,859

U. S. Senator

A. B. Houghton, Rep.	2,034,041
Royal S. Copeland, Dem.	2,084,273
McAlister Coleman, Soc.	111,208

NORTH CAROLINA

Governor

H. F. Seawell, Rep.	286,744
O. Max Gardner, Dem.	348,683

U. S. Representatives

1. M. B. Prescott, Rep.	7,209
Lindsey Warren, Dem.	23,140
2. J. L. Johnson, Rep.	3,005
J. H. Kerr, Dem.	24,129
3. W. G. Mebane, Rep.	17,310
C. L. Abermethy, Dem.	21,740
4. L. L. Wrenn, Rep.	16,434
E. W. Pou, Dem.	31,288
5. J. H. Harden, Rep.	54,813
O. M. Stedman, Dem.	54,980
6. W. C. Downing, Rep.	16,364
J. Bayard Clark, Dem.	26,061
7. A. I. Ferree, Rep.	39,101
W. C. Hamer, Dem.	41,124
8. W. S. Bogle, Rep.	36,251
R. L. Doughton, Dem.	37,535
9. Chas. A. Jones, Rep.	49,799
A. L. Bulwinkle, Dem.	46,756
10. Geo. M. Pritchard, Rep.	49,045
Z. B. Weaver, Dem.	48,607

NORTH DAKOTA

Governor

George F. Shafer, Rep.	131,193
Walter Maddock, Dem.	100,205

U. S. Senator

Lynn G. Frazier, Rep.	159,940
F. F. Burchard, Dem.	38,856

U. S. Representatives

1. O. B. Burtness, Rep.	53,941
W. S. Hooper, Dem.	15,646
2. Thomas Hall, Rep.	42,844
J. L. Page, Dem.	26,566
3. J. H. Sinclair, Rep.	52,220
R. H. Leavitt, Dem.	9,335

OHIO

Governor

Myers Y. Cooper, Rep.	1,355,525
Martin L. Davey, Dem.	1,106,739

U. S. Senator

S. D. Fess, Rep.	1,412,805
C. V. Truax, Dem.	908,952
T. E. Burton, Rep.	1,429,554
G. P. Hunt, Dem.	856,807

U. S. Representatives

1. Nicholas Longworth, Rep.	80,812
Arthur Espy, Dem.	49,880
2. Wm. E. Hess, Rep.	63,605
J. H. Cleveland, Dem.	54,332
3. Roy Fitzgerald, Rep.	101,050
F. L. Humphrey, Dem.	55,767
4. John L. Cable, Rep.	56,291
Wm. Klinger, Dem.	41,677
5. Chas. J. Thompson, Rep.	36,096
F. C. Kniffen, Dem.	31,385
6. Chas. C. Kearns, Rep.	43,516
Geo. B. Nye, Dem.	33,020
7. Chas. Brand, Rep.	75,753
H. E. Rice, Dem.	34,323
8. G. E. Mouser, Rep.	42,199
Brooks Fletcher, Dem.	38,651
9. W. W. Chalmers, Rep.	82,560
Wm. P. Clarke, Dem.	50,601
C. V. Stephenson, W.-C.	190
10. T. A. Jenkins, Rep.	38,347
C. E. Poston, Dem.	16,551
11. E. D. Ricketts, Rep.	30,574
M. G. Underwood, Dem.	34,257
12. J. C. Speaks, Rep.	82,574
C. H. Valentine, Dem.	50,216
13. J. E. Baird, Rep.	54,174
W. C. Martin, Dem.	34,015
14. Francis Seiberling, Rep.	106,253
A. F. O'Neil, Dem.	58,848
15. C. Ellis Moore, Rep.	50,941
F. H. Ward, Dem.	26,441
16. C. M. McClintock, Rep.	73,966
John McSweeney, Dem.	55,778
Jacob Coxey, Ind.	1,428
17. Wm. M. Morgan, Rep.	56,823
Charles West, Dem.	40,846
18. Frank B. Murphy, Rep.	71,378
J. J. Whitacre, Dem.	31,422
Frank Sepech, W.-C.	317
19. J. G. Cooper, Rep.	89,731
Locke Miller, Dem.	40,948
20. O. V. Hensley, Rep.	28,381
Chas. A. Mooney, Dem.	47,313
John Foley, W.-C.	261
21. J. F. Lange, Rep.	26,267
Robert Crosser, Dem.	39,090
22. C. C. Bolton, Rep.	151,565
S. B. Fitzsimmons, Dem.	65,742

OKLAHOMA

U. S. Representatives

1. Charles O'Connor, Rep.	63,638
E. B. Howard, Dem.	58,248
P. J. Dickerson, Soc.	256
2. E. L. Kirby, Rep.	23,431
W. W. Hastings, Dem.	25,447
W. W. Moore, Soc.	80
3. Robert N. Allen, Rep.	21,869
Wilburn Cartwright, Dem.	39,520
Robert E. Lee, Soc.	326
4. Fred L. Patrick, Rep.	36,151
Tom D. McKeown, Dem.	37,191
L. A. Stanwood, Soc.	221

5. U. S. Stone, Rep.	44,816
F. B. Swank, Dem.	42,886
Philip Kusler, Soc.	362
6. W. C. Stevens, Rep.	28,305
Jed Johnson, Dem.	32,817
J. T. Dickerson, Soc.	299
7. Walter S. Mills, Rep.	21,757
Jim V. McClintic, Rep.	26,667
W. L. Russell, Soc.	381
8. M. C. Garber, Rep.	48,445
J. P. Battenberg, Dem.	27,135
L. Deis, Soc.	278

OREGON

U. S. Representatives

1. W. C. Hawley, Rep.	91,839
H. G. Starkweather, Dem.	33,772
U. A. Upton, S.-L.	3,973
2. Robert R. Butler, Rep.	28,865
Walter M. Pierce, Dem.	22,108
W. C. Cundell, S.-L.	893
3. F. F. Korell, Rep.	75,835
W. C. Culbertson, Dem.	29,673
Albert Streiff, S.-L.	3,020

PENNSYLVANIA

U. S. Senator

David A. Reed, Rep.	1,948,646
Wm. N. McNair, Dem.	1,029,055
W. J. Van Essen, Soc.	23,100

U. S. Representatives

1. James M. Beck, Rep.	45,070
Wm. L. Rooney, Dem.	44,956
Chas. Mazer, Soc.	313
2. Geo. S. Graham, Rep.	34,432
John Shanahan, Dem.	18,697
3. Harry C. Ransley, Rep.	30,458
James J. Hayes, Dem.	22,559
4. Benj. M. Golder, Rep.	49,877
Thomas J. Carroll, Dem.	31,006
5. James J. Connolly, Rep.	71,978
6. Geo. A. Welsh, Rep.	89,362
Bruce A. Metzger, Dem.	59,410
7. Geo. P. Darrow, Rep.	91,305
Thomas A. O'Hara, Dem.	42,217
8. James Wolfenden, Rep.	116,266
Henry W. Davis, Dem.	34,607
9. Henry W. Watson, Rep.	102,019
Richard Vaux, Dem.	61,089
10. Wm. W. Griest, Rep.	55,545
John A. McSparran, Dem.	11,395
11. Laurence H. Watres, Rep.	48,521
Frank M. Walsh, Dem.	48,017
Laurence H. Watres, P.	105
12. Henry W. Merritt, Rep.	66,462
Henry W. Merritt, P.	219
John J. Casey, Dem.	69,982
John J. Casey, L.	961
13. Geo. F. Brumm, Rep.	46,486
Bernard V. O'Hare, Dem.	37,243
14. Chas. J. Esterly, Rep.	76,670
A. H. Rothermel, Dem.	36,176
Howard McConough, Soc.	10,712
15. Louis T. McFadden, Rep.	38,459
Cornelia B. Pinchot, Pro.	3,348
16. Edgar R. Keiss, Rep.	47,023
Thomas Wood, Dem.	16,693
Edgar R. Keiss, Pro.	1,017
17. Frederick W. Magrady, Rep.	45,437
S. M. Shipman, Dem.	29,560
18. Edward M. Beers, Rep.	54,547
F. A. Rupp, Dem.	13,070
19. Isaac H. Doutrich, Rep.	80,002
John E. Blair, Dem.	19,032
20. J. Russell Leech, Rep.	29,383
Geo. E. Wolfe, Dem.	24,629
21. J. Banks Kurtz, Rep.	41,993
H. K. Filler, Dem.	13,420
22. Franklin Menges, Rep.	43,830
J. H. Meyers, Dem.	25,622
23. J. Mitchell Chase, Rep.	41,791
T. E. Costello, Dem.	15,219
24. Samuel A. Kendall, Rep.	41,786
J. C. Core, Dem.	23,176
25. Henry W. Temple, Rep.	34,500
J. S. Pates, Dem.	23,260
26. J. Howard Swick, Rep.	63,534
C. H. Sipe, Dem.	24,352
27. Nathan L. Strong, Rep.	52,266
H. W. Fee, Dem.	17,433
28. Thomas C. Cochran, Rep.	57,944
Harry B. Mitchell, Dem.	22,443
29. Milton W. Shreve, Rep.	41,700
Albert L. Thomas, Dem.	28,004
30. Wm. R. Coyle, Rep.	48,421
Everett Kent, Dem.	33,633
31. Adam M. Wyant, Rep.	50,002
H. K. Churns, Soc.	1,437
32. Stephen G. Porter, Rep.	48,837
E. S. Michelowski, Dem.	26,145
33. Clyde Kelly, Rep.	53,551
J. S. Otis, L.	792
34. Patrick J. Sullivan, Rep.	26,192
Hazel K. Gunderman, Pro.	744
35. Harry A. Estep, Rep.	42,450
John J. Murray, Dem.	30,619
Anna D. Thompson, Pro.	718
36. Guy E. Campbell, Rep.	47,515
Wm. E. Madden, Jr., Dem.	31,151

RHODE ISLAND

Governor

Norman S. Case, Rep.	121,748
Alberic A. Archambault, Dem.	113,594

U. S. Representatives

1. Clark Burdick, Rep.	41,919
J. J. Cooney, Dem.	33,844
2. Richards Aldridge, Dem.	42,596
S. D. Mowry, Dem.	34,848
3. Louis Monast, Rep.	34,005
J. E. O'Connell, Dem.	45,170

SOUTH CAROLINA

U. S. Representatives

1. Thomas S. McMillan, Dem.	8,469
2. Butler B. Hare, Dem.	7,648
3. Fred H. Dominick, Dem.	10,917
4. J. J. McSwain, Dem.	8,873
5. W. F. Stevenson, Dem.	8,911
6. A. H. Gasque, Dem.	7,757
7. H. P. Fulmer, Dem.	8,772

SOUTH DAKOTA

Governor

Buell F. Jones, Rep.	121,643
W. J. Bulow, Dem.	136,016
J. G. Sumption, F.-L.	1,509

U. S. Representatives

1. C. A. Christopherson, Rep.	54,573
A. C. Steensland, Dem.	38,055
Frank Hult, F.-L.	775
2. Royal C. Johnson, Rep.	54,846
Fred H. Hildebrandt, Dem.	39,970
Helge Tangen, F.-L.	1,005
3. Wm. Williamson, Rep.	33,245
Arthur Watwood, Dem.	25,412

TENNESSEE

Governor

Raleigh Hopkins, Rep.	124,633
Henry H. Horton, Dem.	195,516

U. S. Senator

Jas. A. Fowler, Rep.	120,259
K. D. McKellar, Dem.	175,329

U. S. Representatives

1. B. Carroll Reese, Rep.	28,152
Wm. I. Giles, Dem.	7,646
2. J. Will Taylor, Rep.	30,917
Leon Jourolman, Dem.	13,968
3. Silas Williams, Rep.	22,405
S. D. McReynolds, Dem.	25,667
4. S. H. Justice, Rep.	7,999
Cordell Hull, Dem.	17,141
5. John F. Caplinger, Rep.	3,126
E. L. Davis, Dem.	12,847
6. E. L. Bradbury, Rep.	6,200
Jos. W. Byrns, Dem.	24,694
7. S. E. Stephens, Rep.	1,268
E. E. Eslick, Dem.	16,898
8. H. E. Cantrell, Rep.	9,184
Gordon Browning, Dem.	17,867
9. H. C. Murchison, Rep.	2,217
Jere Cooper, Dem.	20,184
10. R. L. Harper, Rep.	4,961
Hubert Fisher, Dem.	21,524

TEXAS

U. S. Senator

T. M. Kennerly, Rep.	129,910
Tom Connolly, Dem.	566,139
David Curran, Soc.	690

U. S. Representatives

1. R. F. Stephens, Rep.	3,349
Wright Patman, Dem.	24,267
2. John C. Box, Dem.	38,901
3. M. G. Sanders, Dem.	22,194
4. Floyd Harry, Rep.	4,488
Sam Rayburn, Dem.	23,847
5. Hatton W. Sumners, Dem.	42,482
6. H. Lee Monroe, Rep.	2,714
Luther A. Johnson, Dem.	26,412
7. A. J. Long, Rep.	2,827
C. S. Briggs, Dem.	21,461
8. Geo. E. Kepple, Rep.	9,739
D. E. Garrett, Dem.	43,891
9. L. B. Allen, Rep.	3,718
J. J. Mansfield, Dem.	24,742
10. D. H. Morris, Rep.	2,457
J. P. Buchanan, Dem.	27,890
11. R. C. Bush, Rep.	2,141
O. H. Cross, Dem.	21,484
12. David Sutton, Rep.	7,921
F. G. Lanham, Dem.	30,906
13. Mrs. P. A. Welty, Rep.	4,026
Guinn Williams, Dem.	30,926
14. ——	
15. John N. Garner, Dem.	28,417
16. C. B. Hudspeth, Dem.	31,132
17. R. Q. Lee, Dem.	41,727
18. V. C. Nelson, Rep.	9,137
Marvin Jones, Dem.	58,667

UTAH

Governor

Wm. H. Wattis, Rep.	72,306
Geo. H. Dern, Dem.	102,953
D. C. Dora, Soc.	740

U. S. Senator

Ernest Bamberger, Rep.	77,073
W. H. King, Dem.	97,436
Chas. Stoney, Soc.	998

VERMONT

Governor

John E. Weeks, Rep.	94,974
Harry C. Shurtleff, Dem.	33,563

U. S. Senator

Frank L. Greene, Rep.	93,136
Fred C. Martin, Dem.	37,030

U. S. Representatives

1. E. S. Brigham, Rep.	44,082
J. C. Durick, Dem.	25,095
W. Archer, Pro.	744
2. E. W. Gibson, Rep.	47,141
H. W. Witters, Dem.	11,356
H. W. Kidder, Pro.	940

VIRGINIA

U. S. Senator

Claude A. Swanson, Dem.	275,425

U. S. Representatives

1. S. Otis Bland, Dem.	23,912
2. Menalcus Lankford, Rep.	18,614
J. T. Deal, Dem.	14,668
3. J. D. Peake, Rep.	5,854
Andrew J. Montague, Dem.	23,350
4. P. H. Drewry, Dem.	16,904
5. Taylor G. Vaughan, Rep.	14,049
Joseph Whitehead, Dem.	16,672
6. Clifton A. Woodrum, Dem.	25,091
7. J. A. Garber, Rep.	15,243
T. W. Harrison, Dem.	15,009
8. R. Walton Moore, Dem.	24,368
9. Jos. J. Shaffer, Rep.	32,696
Wm. H. Rouse, Dem.	31,722
10. M. J. Putnam, Rep.	11,230
Henry St. George Tucker, Dem.	14,817

WASHINGTON

Governor

Roland H. Hartley, Rep.	281,991
Scott Bullitt, Dem.	214,334
Jas. F. Stark, S.-L.	3,343

U. S. Senator

Kenneth MacKintosh, Rep.	227,415
C. C. Dill, Dem.	261,524
Alex Noral, W.-C.	666

U. S. Representatives

1. John F. Miller, Rep.	70,703
Hugh Todd, Dem.	36,858
Ruby Herman, Soc.	413
2. Lindley H. Hadley, Rep.	59,534
August Toellner, Ind.	410
3. Albert Johnson, Rep.	77,314
O. M. Nelson, Dem.	33,217
4. John W. Summers, Rep.	48,766
H. O. Bohlke, Dem.	14,512
5. Thomas Corkery, Rep.	35,660
Sam B. Hill, Dem.	50,323

WEST VIRGINIA

Governor

Wm. G. Conley, Rep.	345,909
J. Alfred Taylor, Dem.	296,637
J. H. Snider, Soc.	1,124

U. S. Senator

Henry D. Hatfield, Rep.	327,266
Matthew M. Neeley, Dem.	317,620

U. S. Representatives

1. Carl G. Bachmann, Rep.	62,646
Paul R. Wellman, Dem.	40,666
2. Frank L. Bowman, Rep.	52,424
Ben H. Hiner, Dem.	41,640
3. John M. Wolverton, Rep.	45,167
Wm. S. O'Brien, Dem.	44,447
4. Jas. A. Hughes, Rep.	55,672
Harry S. Darnall, Dem.	42,057
5. Hugh I. Shott, Rep.	63,559
John Kee, Dem.	55,376
6. (Recount pending)	

WISCONSIN

Governor

—— Kohler, Rep.	547,738
—— Schmedeman, Dem.	394,368
—— Hauser, Soc.	36,924

U. S. Senator

Robert M. La Follette, Rep.	635,376
—— Markham, Ind. Rep.	81,302
—— Emerson, Pro.	21,359

U. S. Representatives

1. Henry Allen Cooper, Rep..	83,069
Wm. Kiernan, Dem.	20,534
2. Chas. A. Kading, Rep.	53,530
Eugene A. Clifford, Dem. ..	23,101
3. John M. Nelson, Rep.	62,938
Wm. Victora, Dem.	20,262
4. John C. Schafer, Rep.	37,685
Wm. J. Kershaw, Dem.	28,956
5. Wm. H. Stafford, Rep.	41,265
Thomas O'Malley, Dem.	24,037
Victor Berger, Soc.	40,536
6. Florian Lampert, Rep.	53,952
Morley G. Kelly, Dem.	24,009
7. Merlin Hull, Rep.	49,590
A. H. Schubert, Dem.	18,530
8. Edward C. Brown, Rep. ...	47,848
R. J. Walsh, Dem.	16,316
9. Geo. J. Schneider, Rep. ...	52,300
Jas. H. McGillan, Dem.	33,302
10. James A. Freer, Rep.	59,314
Miles H. McNally, Dem. ...	13,590
11. Hubert H. Peavey, Rep. ...	56,586
Frank P. Kennedy, Dem. ..	11,962

WYOMING

U. S. Senator

C. E. Winter, Rep.	37,076
John B. Kendrick, Dem. ...	43,032
W. W. Wolfe, Soc.	333

U. S. Representatives

Vincent Carter, Rep.	38,935
W. S. Kimball, Dem.	35,972
W. R. Nicodemus, Soc.	333

COGNATE SOCIETIES

GENERAL

AMERICAN ANTIQUARIAN SOCIETY.—Worcester, Mass.

AMERICAN BAPTIST HISTORICAL SOCIETY.—1701 Chestnut St., Philadelphia, Pa.

AMERICAN IRISH HISTORICAL SOCIETY.—132 E. 16th St., New York, N. Y.

AMERICAN JEWISH HISTORICAL SOCIETY.—531 W. 123rd St., New York, N. Y.

AMERICAN HISTORICAL ASSOCIATION.—1140 Woodward Building, Washington, D. C.

AMERICAN NUMISMATIC SOCIETY.—156th St. at Broadway, New York, N. Y.

AMERICAN SCENIC AND HISTORIC PRESERVATION SOCIETY.—154 Nassau St., New York, N. Y.

AMERICAN SOCIETY OF CHURCH HISTORY.—98 Mercer St., Princeton, N. J.

CANADIAN HISTORICAL ASSOCIATION.—Ottawa, Ontario, Can.

HISPANIC SOCIETY OF AMERICA.—156th St., W. of Broadway, New York, N. Y.

HOLLAND SOCIETY OF NEW YORK.—90 West St., New York, N. Y.

HUGUENOT HISTORICAL SOCIETY OF AMERICA.—2 W. 45th St., New York, N. Y.

LINCOLN HISTORY SOCIETY.—30 Irving Place, New York, N. Y.

METHODIST HISTORICAL SOCIETY.—150 Fifth Ave., New York, N. Y.

MISSISSIPPI VALLEY HISTORICAL ASSOCIATION.—Austin, Tex.

NATIONAL HISTORICAL SOCIETY.—33 W. 97th Street, New York, N. Y.

NEW ENGLAND HISTORIC GENEALOGICAL SOCIETY.—9 Ashburton Place, Boston, Mass.

NORTHWESTERN ASSOCIATION OF HISTORY, GOVERNMENT AND ECONOMIC TEACHERS.—Spokane, Wash.

PRESBYTERIAN HISTORICAL SOCIETY.—520 Witherspoon Bldg., Philadelphia, Pa.

SOCIETY FOR THE PRESERVATION OF NEW ENGLAND ANTIQUITIES.—2 Synde St., Boston, Mass.

STEUBEN SOCIETY OF AMERICA.—369 Lexington Avenue, New York, N. Y.

THOMAS PAINE NATIONAL HISTORICAL ASSOCIATION.—50 West 47th St., New York, N. Y.

UNITED STATES CATHOLIC HISTORICAL SOCIETY.—New York, N. Y.

WOODROW WILSON FOUNDATION.—17 E. 42nd St., New York, N. Y.

POLITICAL

DEMOCRATIC PUBLICITY COMMITTEE.—43rd St. and Madison Ave., New York, N. Y.

NATIONAL DEMOCRATIC COMMITTEE.

NATIONAL REPUBLICAN COMMITTEE.

WOMEN'S NATIONAL DEMOCRATIC CLUB, INC.—Hotel Wellington, 235 W. 102nd St., New York, N. Y.

WOMEN'S NATIONAL REPUBLICAN CLUB.—6 E. 37th St., New York, N. Y.

DIVISION II

INTERNATIONAL RELATIONS AFFECTING THE UNITED STATES

THE UNITED STATES FOREIGN SERVICE

By Margaret deForest Hicks Williams

Writer and Specialist on International Affairs

REORGANIZATION OF SERVICE

Provision is made in the Rogers Bill enacted July 1, 1924, that "hereafter the Diplomatic and Consular Service of the United States shall be known as the Foreign Service of the United States."

Foreign Service Officer.—This term shall be the designation of every member of the Foreign Service below the rank of minister, "all of whom are subject to promotion on merit and who may be assigned to duty in either the diplomatic or the consular branch of the Foreign Service at the discretion of the President."

Classes.—The former consular and diplomatic classes are done away with, and provision is made for nine new classes with salaries ranging from $9,000 in class one, downward to $3,000 in class nine; and with unclassified subordinate grades from $3,000 downward.

Appointments to the position of Foreign Service officer shall be made only after examination and a suitable period of probation in an unclassified grade; or, after five years of continuous service in the Department of State, by transfer therefrom under such rules and regulations as the President may prescribe. From time to time, the Secretary of State shall report to the President the names of Foreign Service officers showing special ability, or showing merit, for promotion to the rank of minister, and the names of persons found upon taking the prescribed examinations to have fitness for appointment to the service. Reclassification of the former diplomatic and consular officers has provided the new grades, one to nine, respectively, prescribed under the new law. All Foreign Service officers must deposit a bond with the Treasury of the United States. Foreign Service officers inspecting either diplomatic or consular offices shall have the same duties, powers, and prerogatives formerly accorded the consuls general at large under the old system.

Salaries.—A very important provision, in view of the fact that the Act does not raise the salaries of Ambassadors ($17,500) or Ministers ($12,000 and $10,000), is that the President may grant them "representation allowances out of any money which may be appropriated for such purposes from time to time by Congress." Any Foreign Service officer may be assigned to the Department of State for a limited period without loss of class or salary. At the discretion of the Secretary of State, a Foreign Service officer may be ordered to the United States on statutory leave of absence.

Grades.—Foreign Service officers may be appointed to serve as Counselors of Embassy or Legation, Commissioners, Chargés d'Affaires, Ministers Resident, or Diplomatic Agents, without loss of grade, class, or salary, and with, in certain cases, additional compensation. Foreign Service officers may be retired upon reaching the age of 65 years; annual pensions may be

paid from an annuity fund secured by a yearly deduction of 5 per cent from salaries, and a commensurate yearly contribution to the fund by the Government. Retired Foreign Service officers may be recalled to active service in the event of public emergency.

Assistant Secretaries.—The titles Second Assistant Secretary of State and Third Assistant Secretary of State shall hereafter be known as Assistant Secretary of State, without numerical distinction of rank. An additional Secretary of State replaces the former position of Director of the Consular Service. The Act became law on July 1, 1924. All former provisions of law not inconsistent with the Rogers Act are made applicable, and all contrary provisions are repealed.

BOARDS AND COMMITTEES

Foreign Service Personnel Board.—The duties of this Board are to examine into the character, ability, efficiency, experience and general availability of all members of the service with a view to promotion, transfers, the consideration of controversies or delinquencies, and the recommendation of those showing marked general ability to the rank of minister, as vacancies arise. The Board is composed of the Under Secretary of State who is chairman, an Assistant Secretary of State, the Assistant Secretary of State formerly known as the Director of the Consular Service, and members of the Executive Committee of the Foreign Service Personnel Board.

The Executive Committee.—The duties of the Executive Committee of the Foreign Service Personnel Board are left to the discretion of the Secretary of State and are prescribed by him. The Board is composed of a chairman and two other members who are Foreign Service officers of high rank representing both the diplomatic and consular branches of the Foreign Service. These three are selected by the other members of the Personnel Board with the approval of the Secretary of State.

The Board of Examiners.—The duties of this Board are to formulate rules for, and hold examinations of, applicants for commission to the Foreign Service, to determine those who are fitted for appointment, and the scope and method of the examinations. These shall be both oral and written, and open only to American citizens of good standing between the ages of 22 and 35 who have been designated by the President for appointment subject to examination. The Board is composed of the Under Secretary of State, an Assistant Secretary of State to be designated by the Secretary of State, the Assistant Secretary of State formerly known as the Director of the Consular Service, the chairman of the Executive Committee of the Foreign Service Personnel Board, and the Chief Examiner of the Civil Service Commission or such persons as may be designated by him to serve in his stead.

THE FOREIGN SERVICE SCHOOL

Purposes.—The purpose of this school is to provide a one-year term of instruction in the Department of State as a period of probation for those successfully passing the examinations given by the Board of Examiners, and to adjudge, during this period, the new appointees to the service, as to their qualifications for advancement and assignment to duty as Foreign Service officers. The governance of the school is to be set forth in rules and regulations prescribed by the Secretary of State. The school is under the direction of the Foreign Service School Board.

The Foreign Service School Board.—The duties of this Board are to act in all matters concerning the functions of the school with the approval of the Secretary of State, to select the chief instructor of the Foreign Service School from among the officers of the Foreign Service with the approval of the Secretary of State, and in its discretion to select other instructors from among the qualified officers of the Department of State, the Foreign Service, the executive departments of the Government, and other available sources. The Board is composed of the Under Secretary of State, an Assistant Secretary of State to be designated by the Secre-

tary of State, the Assistant Secretary of State formerly known as the Director of the Consular Service, the chairman of the Executive Committee of the Foreign Service Personnel Board, and the chief instructors of the Foreign Service School.

FOREIGN SERVICE PERSONNEL

Changes.—During 1928, two hundred and nineteen persons took the examination for appointment as officers in the United States Foreign Service. Eighty-seven of this number failed the written examination and were not permitted to take the oral. Forty-seven of those who took both were passed and appointed to the Foreign Service school in the Department of State for the prescribed year of probation. At the end of the year, thirty-six were appointed into the two lowest grades of the Service; namely, Foreign Service officers unclassified, and Vice-Consuls of Career. Twelve women presented themselves

Former Classification	Former Salary	New Classification as Foreign Service Officer	New Salary	No. in Grade as of Oct. 1, 1928
Secretary, Class One (Counsel of Emb.)	$4,000	Class One	$9,000	19
Consul General, Class One	12,000*	Class One	9,000	
Consul General, Class Two	8,000	Class One	9,000	
Secretary, Class One (Counselor of Legation)	4,000	Class Two	8,000	26
Consul General, Class Three	6,000	Class Two	8,000	
Secretary, Class One	4,000	Class Three	7,000	46
Consul General, Class Four	5,500	Class Three	7,000	
Consul General at Large	5,000	.....	5,000	
Secretary, Class Two	3,625	Class Four	6,000	61
Consul General, Class Five	4,500	Class Four	6,000	
Consul, Class One	8,000*	Class Four	6,000	
Consul, Class Two	6,000	Class Four	6,000	
Consul, Class Three	5,000	Class Four	6,000	
Chinese Secretary	5,500	Class Four	6,000	
Japanese Secretary	5,500	Class Four	6,000	
Turkish Secretary	5,500	Class Four	6,000	
Consul, Class Four	4,500	Class Five	5,000	65
Secretary, Class Three	3,000	Class Six	4,500	84
Consul, Class Five	4,000	Class Six	4,500	
Chinese Asst. Secretary	4,000	Class Six	4,500	
Japanese Asst. Secretary	4,000	Class Six	4,500	
Turkish Asst. Secretary	4,000	Class Six	4,500	
Consul, Class Six	3,500	Class Seven	4,000	93
Secretary, Class Four	2,500	Class Eight	3,500	89
Consul, Class Seven	3,000	Class Eight	3,500	
Consul, Class Eight	2,500	Class Nine	3,000	0
Consul, Class Nine	2,000	Class Nine	3,000	
Vice-Consul of Career	2,500	.....		185
	2,750	.....		
	3,000	Unclassified	3,000	
Consular Assistants	1,500	.....		
	2,500	Unclassified	2,500	
Interpreters	2,000	Unclassified	2,000	
Student Interpreters	1,500	Unclassified	1,500	

* Sect. 8 of the Rogers Act provides "that Consuls General of Class One, and Consuls of Class One, holding office at the time this Act takes effect shall not, as a result of their recommissioning or reclassification, suffer a reduction in salary below that which they were then receiving: *provided, however*, that this provision shall apply only to the incumbents of offices mentioned at the time this Act became effective."

for the written examination. Eight passed and took the oral examination. None passed the oral examination nor were any appointed to the Foreign Service School.

Promotion from Ranks.—Since 1925, when the policy was formulated of promoting outstanding officers of the Service to the grade of minister and ambassador instead of drawing them from civil life, there have been marked advances. In the year 1928, twenty ministers, five ambassadors, two diplomatic agents, and one Assistant Secretary of State were men who had worked their way up from the lowest grades in the Service. The appointments during the year were proportionate to those of other years since 1925.

Losses to Service.—During 1928, there were three deaths, thirteen resignations, and 2 retirements in the Foreign Service. In most cases the cause for resignation was the small salaries which still, even with the passage of the Rogers Act, attach to the positions of the Service. It continues to be a practical impossibility for an officer to occupy any of the higher ranks in the Service and maintain his position on his salary alone, —a deplorable fact which obviously needs to be remedied by Congressional action.

RECLASSIFICATION TABLES

The practical results of the putting into effect of the provisions of the Rogers Act and Executive Order No. 4022 may be seen from the table on p. 47 which shows the reclassification from the old to the new status with the corresponding changes in salaries.

DIPLOMATIC PERSONNEL

ACCREDITED BY THE UNITED STATES

Name of Country		Appointed
AMBASSADORS		
Argentina	Robert Woods Bliss	1927
Belgium	Hugh S. Gibson	1927
Brazil	Edwin V. Morgan	1912
Chile	William S. Culbertson	1928
Cuba	Noble Brandon Judah	1927
France	Myron T. Herrick	1921
Germany	Jacob Gould Schurman	1925
Great Britain	Alanson B. Houghton	1925
Italy	Henry P. Fletcher	1924
Japan	Charles MacVeagh	1925
Mexico	Dwight T. Morrow	1927
Peru	Alexander P. Moore	1928
Spain	Ogden H. Hammond	1925
Turkey	Joseph C. Grew	1927
Union of Soviet Socialist Republics	(No diplomatic relations)	
MINISTERS		
Albania	Charles C. Hart	1925
Austria	Albert Henry Washburn	1922
Bolivia	David E. Kaufman	1928
Bulgaria	H. F. Arthur Schoenfeld	1928
Canada	William Phillips	1927
China	John Van A. MacMurray	1925
Colombia	Jefferson Caffery	1928
Costa Rica	Roy T. Davis	1922
Czechoslovakia	Lewis Einstein	1921
Danzig, Free City of	Edwin Carl Kemp (Consul)	1923
Denmark	H. Percival Dodge	1926
Dominican Republic	Evan E. Young	1925
Ecuador	Gerhard A. Bading	1922

ACCREDITED TO THE UNITED STATES

		Commissioned
AMBASSADORS		
Señor Dr. Don Manuel E. Malbran		1928
Señor Highness Prince Albert de Ligne		1927
Señor S. Gurgél do Amaral		1925
Señor Don Carlos G. Dávila		1927
Señor Don Orestes Ferrara		1926
M. Paul Claudel		1927
Herr Friedrich Wilhelm von Prittwitz		1928
The Rt. Hon. Sir Esme Howard, G.C.M.G., K.C.B., C.V.O.		1924
Nobile Giacomo de Martino		1925
M. Katsuji Debuchi		1928
Señor Don Manuel C. Tellez		1925
Señor Dr. Hernán Velarde		1924
Señor Don Alejandro Padilla y Bell		1926
Ahmed Mouhtar Bey		1927
(No diplomatic relations)		
MINISTERS		
M. Faïk Konitza		1926
Herr Edgar L. G. Prochnik		1925
Señor Don Eduardo Diez de Medina		1928
M. Simeon Radeff		1925
The Hon. Vincent Massey		1927
M. Sao-ke Alfred Sze		1921
Dr. Enrique Olaya		1922
Señor Don Manuel Castro Quesada		1928
M. Ferdinand Veverka		1928
.....		
M. Constantin Brun		1912
Señor Angel Morales		1926
Señor Don Gonzalo Zaldumbide		1928

ACCREDITED BY THE UNITED STATES

MINISTERS (*Continued*)

Name of Country		Appointed
Egypt	Franklin Mott Gunther	1928
Estonia	Frederick W. B. Coleman	1922
Ethiopia (Abyssinia)	Addison E. Southard (Min. Res.)	1927
Finland	Alfred J. Pearson	1925
Greece	Robert P. Skinner	1926
Guatemala	Arthur H. Geissler	1922
Haiti	Stuart E. Grummon (3rd Sec.)	1928
Honduras	George T. Summerlin	1925
Hungary	J. Butler Wright	1927
Iraq (Mesopotamia)	John Randolph (Consul)	1923
Irish Free State	Frederick A. Sterling	1927
Latvia	Frederick W. B. Coleman	1922
Liberia	William T. Francis	1927
Lithuania	Frederick W. B. Coleman	1922
Luxemburg	Hugh S. Gibson	1927
Monaco	Otis A. Glazebrook (Consul)	1927
Morocco	Maxwell Blake (Dip. Agent)	1925
Netherlands	Richard M. Tobin	1923
Nicaragua	Charles C. Eberhardt	1925
Norway	Laurits S. Swenson	1921
Palestine	Paul Knabenshue (Con. Gen.)	1928
Panama	John Glover Smith	1921
Paraguay	George L. Kreeck	1925
Persia	Hoffman Philip	1925
Poland	John B. Stetson, Jr.	1925
Portugal	Fred Morris Dearing	1922
Rumania	Charles S. Wilson	1928
Salvador	Warren D. Robbins	1928
San Marino	Joseph E. Haven (Consul)	1925
Serbs, Croats, and Slovenes, Kingdom of	John Dyneley Prince	1926
Siam	Harold Orville Mackenzie	1927
Sweden	Leland Harrison	1927
Switzerland	Hugh R. Wilson	1927
Syria	George L. Brandt (Consul)	1928
Uruguay	U. Grant Smith	1925
Venezuela	Willis C. Cook	1921

ACCREDITED TO THE UNITED STATES

MINISTERS (*Continued*)

	Commissioned
Mahmud Samy Pasha	1925
Colonel Victor Mutt, Con. Gen. N. Y. in charge of Legation	1927
.....	
M. L. Aström	1922
M. Charalambos Simopoulos	1924
Señor Dr. Don Adrian Recinos	1928
M. Raul Lizaire (Sec. Leg.)	1928
Señor Don Luis Bográn	1925
Count László Széchényi	1922
.....	
Mr. Timothy A. Smiddy	1924
.....	
Mr. Arthur B. Lule (Con. Gen. N. Y. in charge of Legation)	1927
M. Bronius Kasimir Balutis	1928
Baron Raymond de Waha (Chargé d'Affaires)	1920
.....	
.....	
Herr J. H. van Royen	1927
Señor Dr. Don Alejandro César	1927
Herr Halvard H. Bachke	1927
.....	
Señor Dr. Don Ricardo J. Alfaro	1922
Señor Dr. Juan V. Ramírez (Sec. Leg.)	1925
Mirza Davoud Khan Meftah	1926
Jan Ciechanowski	1925
Viscount d'Alte	1902
George Cretziano	1926
Señor Dr. Don Francisco A. Lima	1927
.....	
M. Bojidar Pouritch (Chargé d'Affaires)	1928
Lieutenant General Phya Vijitavongs	1926
M. W. Boström	1926
M. Marc Peter	1920
.....	
Señor Dr. J. Varela	1920
Señor Dr. Don Carlos F. Grisanti	1926

TREATIES COMPLETED AND RATIFIED

By Frederick L. Schuman

Political Science Instructor, University of Chicago

AGREEMENTS NEGOTIATED

Since the last issue of The American Year Book, the United States has concluded seven international agreements with foreign powers, as compared with ten for 1927 and more than twenty for 1926. The Treaty Series for the present year runs from No. 759 to No. 765, the latter figure indicating the total number of agreements entered into by the United States since 1776. Of the seven agree-

ments of 1928, three were treaties, three were conventions and one was a protocol. All were ratified by the Senate.

OFFICIAL LIST OF TREATIES AND CONVENTIONS

(1) Convention between the United States and Belgium for the prevention of smuggling of intoxicating liquors, signed at Washington, December 9, 1925, proclaimed January 11, 1928. (Treaty Series No. 759.)
(2) Treaty between the United States and the Netherlands for the advancement of peace, signed at Washington, December 18, 1913, proclaimed March 12, 1928 (Treaty Series No. 760). Supplemented by an exchange of notes extending time for appointment of the commission under Article II of Treaty of December 18, 1913, signed September 8, 1928 (No. 760-A).
(3) Supplementary Extradition Convention between the United States and Honduras, signed at Tegucigalpa, February 21, 1927, proclaimed June 7, 1928 (Treaty Series No. 761).
(4) Convention between the United States and other powers revising the International Sanitary Convention of January 17, 1912, signed at Paris, June 21, 1926, proclaimed June 21, 1928 (Treaty Series No. 762).
(5) Additional Protocol between the United States and other American Republics amending the Pan-American Sanitary Convention signed at Havana, November 14, 1924, signed at Lima, October 19, 1927, proclaimed July 5, 1928 (Treaty Series No. 763).
(6) Treaty between the United States and Honduras on friendship, commerce and consular rights, signed at Tegucigalpa, December 7, 1927, proclaimed July 23, 1928 (Treaty Series No. 764).
(7) Treaty between the United States and Latvia on friendship, commerce and consular rights, signed at Riga, April 20, 1928, proclaimed July 25, 1928 (Treaty Series No. 765).

BELGIUM

The Convention with Belgium (6 articles) is identical with other agreements for the same purpose. It authorizes the search of Belgian vessels by American prohibition agents outside of American territorial waters but within one hour's run from the American coast and provides for seizure and adjudication if evidence is discovered of actual or attempted violation of American prohibition laws.

NETHERLANDS

The Treaty with the Netherlands (4 articles) is one of the so-called Bryan "cooling-off" agreements of 1913. It refers all disputes "of every nature whatsoever," not otherwise settled, to a permanent International Commission of five members for investigation and report. The report is to be rendered within one year, during which time the parties agree not to declare war nor begin hostilities against one another. An interpretative declaration was signed on February 13, 1928, stating that the disputes referred to included those existing at the time of signature of the treaty as well as future ones. It may be noted in passing that, although the United States concluded such treaties with many countries, the procedure of settlement provided for has never been availed of in any instance.

HONDURAS AND LATVIA

The Supplementary Extradition Convention with Honduras (3 articles) merely adds two categories of crimes to the extraditable offenses listed in the convention of January 15, 1909: crimes against laws for the suppression of the traffic in narcotic drugs, and infractions of customs laws and ordinances which may constitute crimes.

The multilateral sanitary convention is a lengthy code of 172 articles, providing for international coöperation in dealing with epidemics of cholera, yellow fever, typhus, smallpox, etc., and making special sanitary provisions for the Suez Canal and vicinity and for the regulation of pilgrimages in the Near East. The amending protocol to the Pan-American Sanitary Convention of 1924 consists of but a single article providing that the exchange of ratifications of the Convention shall take place by deposit in the office of the Secretary of State of Cuba.

The two commercial and consular conventions with Honduras and Latvia (30 and 31 articles respectively) are practically identical and follow the model of all recent agreements of this character concluded by the United States. They provide for reciprocal freedom of travel, commerce, navigation and residence, national treatment of vessels in regard to taxes and dues and unconditional

most-favored-nation treatment in regard to customs duties.

TREATIES PENDING RATIFICATION

It is interesting to note that in the case of the agreements summarized above the period of time between the signature of the instrument and the advice of ratification by the Senate varied from one month in the case of the convention with Latvia to twenty-one months in the case of the Sanitary Convention. The Treaty of 1913 with the Netherlands was ratified by the Senate eight months after its submission, but owing to unforeseen delays the formal act of ratification by the President was postponed until March 14, 1917, ratification by the Netherlands until July 8, 1924, and the exchange of ratifications until March 10, 1928. There are, however, no fewer than twenty-four treaties and conventions before the Senate at the present time, awaiting action by that body. This figure includes only those agreements submitted to the Senate since the first session of the Sixty-sixth Congress (1919).

While the list is too long for a complete enumeration here, the following are believed to be the most significant agreements now pending in the Senate:

(1) Agreement signed at Washington, February 1, 1923, between the United States and Costa Rica by which the two Governments engage themselves to enter into negotiations with each other to settle the plan and the agreements which may be found necessary to accomplish the construction and to provide for the ownership and control of an interoceanic canal across Costa Rican territory.

(2) Treaty signed at Lausanne, August 6, 1923, between the United States and Turkey to regulate the general relations between them. This Treaty failed of ratification in the Senate by six votes on January 18, 1927, but has not been withdrawn from the Senate by the President. Diplomatic relations between the United States and Turkey were resumed in February, 1927, but apparently no further progress has been made toward putting Turkish-American relations on a stable treaty basis.

(3) International Convention signed at Geneva, June 17, 1925, for the supervision of the international trade in arms, ammunition and in implements of war.

(4) Protocol signed at Geneva, June 17, 1925, for the prohibition of the use in war of asphyxiating, poisonous, or other gases and of bacteriological methods of warfare.

(5) Convention between the United States and Japan to aid in the prevention of the smuggling of alcoholic beverages into the United States, signed at Washington, May 31, 1928.

(6) Treaty of friendship, commerce and consular rights between the United States and Austria, signed at Vienna on June 19, 1928.

(7) Naturalization treaty between the United States and Czechoslovakia, signed at Prague on July 16, 1928.

(8) Treaty regulating the tariff relations between the United States and China, signed at Peking, July 25, 1928. This is significant as one of the most important steps in the direction of according tariff autonomy to China.

(9) Multilateral treaty for the renunciation of war, signed in Paris, August 27, 1928.

TREATIES EXPIRED OR ABROGATED

The Root Arbitration Conventions of 1908, five in number, expired by limitation during 1928. These comprise the Conventions with France, signed February 10, 1908, expired February 27, 1928; Great Britain, signed April 14, 1908, expired June 4, 1928; Japan, signed May 5, 1908, expired August 24, 1928; Norway, signed April 4, 1908, expired June 24, 1928; Portugal, signed April 6, 1908, expired November 14, 1928.

Honduras.—In addition to these, the treaty of friendship, commerce and navigation, concluded between the United States and Honduras on July 4, 1864, was superseded by the treaty of friendship, commerce and consular rights between the two Governments, concluded December 7, 1927, as provided in Article XXIX thereof, by the exchange of ratifications of that treaty, on July 19, 1928.

U OF I
LIBRARY

THE UNITED STATES AND WORLD AFFAIRS

By John M. Mathews

Professor, University of Illinois

KELLOGG PEACE TREATY

Negotiations with France.—The proposed multilateral treaty for the renunciation of war was the most prominent issue of foreign policy before the American nation during 1928. As outlined previously (The American Year Book for 1927, p. 41), Secretary Kellogg finally replied to the original Briand proposal of April, 1927, but instead of accepting the French suggestion for a bilateral treaty, he proposed the making of a multilateral treaty along these lines, to which all the nations of the world might become signatories. The French Government at first evinced an unwillingness to agree to this broadening of the proposal, alleging that it might conflict with her obligations as a member of the League of Nations and as a signatory of the Locarno treaties and certain other treaties of neutrality. Our Government, however, declined to admit that there was any incompatibility between the proposed treaty and the obligations which France had already assumed. At the same time, Secretary Kellogg intimated that he was prepared to make certain concessions and modifications in the draft of the treaty, which he regarded as non-essential, in deference to the French point of view. The French Government insisted that the right of self-defense should be preserved and that each nation should determine when it was necessary to take measures in self-defense. Secretary Kellogg admitted that this right is fundamental and cannot be abridged by treaty.

British "Monroe Doctrine."—The British Government supported the French view as to the necessity of safeguarding the right of self-defense and the obligations under the League of Nations and Locarno. It also asserted a British Monroe Doctrine in the statement that "His Majesty's Government in Great Britain accept the new treaty upon the distinct understanding that it does not prejudice their freedom of action in certain regions of the world, the welfare and integrity of which constitute a special and vital interest of our peace and safety." Where these regions are located, however, was not specified. Secretary Kellogg made no direct comment on the British Monroe Doctrine, which seemed to constitute a tacit acceptance of this interpretation. It was agreed, however, that these interpretations and understandings should in the main not be placed in the body of the text of the treaty.

Signatories.—As a result of these negotiations agreement was finally reached whereby fifteen nations were to become original signatories of the pact, and the other independent nations of the world were to be invited to adhere. The pact was finally signed at Paris on August 27th but it was arranged that deposit of ratifications should be made in Washington. The original signatories are the United States, France, Great Britain, Germany, Italy, Japan, Irish Free State, Canada, Australia, New Zealand, South Africa, India, Belgium, Czechoslovakia, and Poland. All but five of the other independent nations of the world had, by the end of the year, either adhered to the pact or indicated their intention to do so.

Text of Treaty.—It is still necessary, before the pact goes into effect, that it should be ratified and in the United States this requires the approval of the Senate. At the opening of Congress in December, President Coolidge sent the draft of the treaty to the Senate and expressed the hope that it would receive the approval of that body. Omitting the preamble, the text of the two principal articles of the treaty is as follows:

(1) The High Contracting Parties solemnly declare in the names of their respective peoples that they condemn recourse to war for the solution of international controversies, and renounce it as an instrument of national policy in their relations with one

another. (2) The High Contracting Parties agree that the settlement or solution of all disputes or conflicts of whatever nature or of whatever origin they may be, which may arise among them, shall never be sought except by pacific means.

EVALUATION OF THE KELLOGG PACT

Obligations and Scope.—By those who desire that the United States should engage in a larger measure of international coöperation, the Kellogg pact was hailed as an important step in this direction. It was felt that, as a result of American participation in such a treaty, the support of the United States would be enlisted in cooperative action against any nation which goes to war in violation of the pact. There are, however, no express sanctions contained in the pact. As far as its language is concerned, if one nation violates the pact the other signatories do not undertake to do anything about it. In this respect the Kellogg pact does not go as far as the Covenant of the League of Nations. Senator Borah was quoted as saying that "it is quite inconceivable that this country would stand idly by in case of a grave breach of a multilateral treaty to which it is a party." He admitted, however, that our Government must reserve the right to decide whether the treaty has been violated and, if so, what coercive measures it should take. The position of the administration was that the taking of coercive measures by the United States will be permitted but not required. The pact does not alter the legal relations between the United States and the League, but, from a practical point of view it may bring the United States into closer coöperation with the members of the League in accomplishing one of the purposes of the League, viz., the prevention of aggressive war.

Effect on Armaments.—It has been thought by some people and even some governments that the signing and ratification of the Kellogg pact must logically be followed by greatly accelerated progress in the direction of general disarmament. This view was expressed by the German and Russian governments and also by some prominent citizens in the United States, such as President Nicholas Murray Butler. This view, however, does not seem to be shared by the administration at Washington, which has recommended that Congress pass a bill for the construction of a number of additional cruisers. It is true of course that our action in signing the Kellogg pact is not inconsistent with maintaining armaments sufficient for self-defense. If no nation armed aggressively, our armaments might be still further reduced. But we know that even the most solemn compacts may be broken. Nevertheless, it would seem that the general tendency of the Kellogg pact is in the direction of limitation of armaments, although real progress in this direction will probably require a distinct general agreement.

Relation to Monroe Doctrine.—Another question that may be raised is to the relation between the Kellogg pact and the Monroe Doctrine. In such great esteem is this Doctrine held by the American people that it is inconceivable that the administration at Washington would enter into a multilateral treaty inconsistent with the maintenance of the Doctrine. Nevertheless, under the Doctrine we have been and may, in the future, be called upon to land marines in Latin-American countries or to engage in other warlike operations in that region for the protection of the person and property of American or European citizens. Do such operations constitute war in the sense in which the word "war" is used in the Kellogg pact? Although there is no official definition of war either in the text of the pact or in the various interpretations, it seems clear that the administration does not construe the language of the pact as broad enough to restrain us from sending military or naval expeditions to Central America. Great Britain, by insisting on a Monroe Doctrine of her own, is precluded from objecting to ours. Moreover, it might be argued that the reservation regarding the right of self-defense leaves the United States free to take such positive military measures as it has been accustomed to take under the Monroe Doctrine. It

is true that the idea involved in the Doctrine as originally promulgated was mainly that of self-defense. It must be admitted, however, that in its recent extensions, the Doctrine has departed very far from that idea.

Bearing on War and Peace.—The Kellogg pact may be criticized on the ground that, while undertaking to renounce war, it does nothing to remove the causes of war. The renunciation of war does not, in and by itself, prevent international disputes from arising. If they can no longer be settled by war, then stronger means of pacific settlement than now exist should be provided. Some of the boundary lines of European countries, as at present fixed, are deemed inequitable by the countries concerned. Their sense of injustice over this condition may lead to war in violation of the pact, but the pact itself supplies no machinery for the peaceful settlement of such international difficulties. In order to supply this need, the World Court should be strengthened by the adhesion of the United States and by the wider acceptance among the great powers of the optional clause for compulsory jurisdiction.

Non-justiciable Disputes.—Stronger treaties of arbitration and conciliation should also be adopted for the settlement of disputes of a non-justiciable character. In this connection may be mentioned the Franco-American arbitration treaty of 1928 which replaces the Root treaty of 1908. The new treaty does not except questions of national honor and vital interests from the obligation to arbitrate, but it does except from such obligation questions of domestic jurisdiction and those involving the Monroe Doctrine. These exceptions weaken the treaty and it is further weakened by the provision that in each case of arbitration a special agreement defining the issue must be entered into. Such an agreement must be approved by the Senate.

Moral Force.—It is possible to find so many legal loopholes in the Kellogg pact that, from the legal point of view it may be considered a mere futile gesture. Such a view, however, should not be allowed to obscure the moral force of the pact, wherein lies, perhaps, its greatest significance. If the ideal of universal peace is ever to be reached, it will be necessary to scrap not only battleships but also the war mind, and to substitute therefor a peace mind strong enough to exercise a controlling influence over governmental action. By putting the nations definitely on record against war, it causes people to think in terms of peace and it gives the growing peace sentiment among peoples of all nations definite support in those crises when threats of war are heard. Thus the Kellogg pact may find its greatest value in serving as a means whereby public opinion may insist on the observance by governments of its demands that peace be preserved.

THE UNITED STATES AND THE LEAGUE OF NATIONS

The United States continued to cooperate to some extent with the League of Nations, especially in economic matters. Thus, the import and export restrictions convention, drawn up at a general conference held under the auspices of the League, was signed by our Government. The United States also participated in the sessions of the League's preparatory disarmament commission. Our Government accepted the League's invitation to participate in the conference on economic statistics but declined to collaborate in the appointment of the opium board and also to participate in the work of the arbitration and security committee.

THE UNITED STATES AND THE WORLD COURT

Gillett Resolution on Adhesion.—The question of American adhesion to the Permanent Court of International Justice continued to hang fire, depending for its solution apparently on whether or not the Covenant of the League of Nations is to be construed as requiring unanimity in requesting advisory opinions. No authoritative determination of this matter of construction has been reached. Since the Administration at Washington seemed to be making no effort to resume negotiations so as to overcome the im-

passe, Senator Gillett of Massachusetts introduced in the Senate in February a resolution suggesting to the President "the advisability of a further exchange of views with the signatory states in order to establish whether the differences between the United States and the signatory states can be satisfactorily adjusted." This resolution was referred to the Senate committee on foreign relations, which discussed it at several sessions during the spring, but by a vote of 9 to 8 decided to postpone action until after the meeting of the December session of Congress.

Election of Hughes.—During the year John Bassett Moore, formerly Professor of International Law at Columbia University, resigned his position as one of the judges of the court. Thereupon, in order to provide for serving out his term, which expires in 1930, Charles Evans Hughes, formerly United States Secretary of State and Associate Justice of the Supreme Court of the United States, was by a large vote nominated by the national groups accredited to the Permanent Court of Arbitration and elected by the council and assembly of the League of Nations. The election of Mr. Hughes tended to revive American interest in the World Court, and it was reported, shortly before the convening of Congress in December, that President Coolidge intended to resume negotiations on the subject.

CONCILIATION AND ARBITRATION

New Treaties.—In addition to the French arbitration treaty, mentioned above, ten new arbitration treaties were signed during the year. Furthermore, in May, our Government signed a new conciliation treaty with Germany. It is modeled after the Bryan so-called "cooling-off" or "wait-a-year" treaties, which Germany declined to sign at the time they were originally proposed. A permanent international commission is created to which disputes of whatever nature may be submitted for investigation and report. The essential and characteristic feature of the treaty is that the signatory parties agree not to declare war on each other or to begin hostilities prior to the submission of the report. The treaty must be approved by the Senate.

DISARMAMENT

Franco-British Agreement.—In September, the United States rejected the Franco-British agreement on naval limitation as a basis for the discussion of that subject. In his Armistice Day address, President Coolidge summarized the reason for the rejection in the statement that "France and England made a tentative offer which would limit the kind of cruisers and submarines adapted to the use of the United States, but left without limit the kind adapted to their use." He added that the result of the acceptance of the offer would be that the "French Army and the English Navy would be so near unlimited that the principle of limitation would be virtually abandoned."

New Cruisers Bill.—At the opening of the annual session of Congress in December, the President included in his message to that body a recommendation for the passage of the bill authorizing the construction of several new cruisers, but with the elimination of the time clause.

Britten Note to Premier Baldwin.—Representative Britten of Illinois, chairman of the House committee on naval affairs, disregarding the customary methods of international intercourse through the state department, proposed directly to Premier Stanley Baldwin of England that a conference on disarmament be held in Canada after March 4th. As was not surprising, this suggestion brought no immediate result, and the present outlook for general disarmament does not seem particularly promising.

THE UNITED STATES AND RUSSIA

Soviet Non-recognition.—During the year our Government continued its policy of non-recognition of the present Soviet Government of Russia. The stated reasons for this policy were the failure of that Government to acknowledge the obligation of the debts incurred by its predecessor during the World War and also the al-

leged attempt of that Government to carry on revolutionary propaganda in the United States. Visas, however, were granted to Russians desiring to visit the United States for trade purposes, provided they were not connected with the Soviet Government and were not and had not been engaged in such propaganda. Our Government interposed no objection to our citizens carrying on trade with Russia, but maintained steadfast opposition to the flotation of Russian loans in this country.

Recognition and Kellogg Pact.—On account of our non-recognition of the Soviet Government, we did not invite that Government to adhere to the Kellogg anti-war pact, but the Soviet Government nevertheless adhered as a result of an invitation extended by France. The question has been raised as to whether ratification of the pact by the United States will constitute recognition of Russia. Senator Borah was quoted as expressing the view that it would, but the Administration at Washington was understood to hold that it would not constitute recognition, since the question of recognition is one not only of fact but also of intention.

THE UNITED STATES AND PAN-AMERICANISM

Havana Conference.—Representatives of the twenty-one independent American states assembled in Havana in January to attend the sixth Pan-American Conference. The meeting was signalized by addresses delivered by President Coolidge and Charles Evans Hughes, chief of the delegation of the United States. Dr. Bustamente of Cuba, member of the Permanent Court of International Justice, was elected president of the Conference and Mr. Hughes was made vice-president.

Pan-American Union.—In order to meet the desire of several Latin-American states, a change was made in the organization of the Pan-American Union so as to provide that special representatives on the governing board of the Union might be sent by those nations who should wish not to employ for that purpose their regular diplomatic representatives at Washington.

Questions of Intervention.—In view of the fact that intervention by the United States in Nicaragua was in progress at the time the Conference was held, the question of intervention aroused considerable interest and debate. An effort was made to secure the adoption of a resolution unqualifiedly denouncing intervention by one state in the internal affairs of another. This was opposed by our Government, however, which was successful in its insistence upon the maintenance of the principle that a nation has duties as well as rights and its failure to observe such duties may under certain circumstances give to other nations the right of intervention.

International Disputes.—The United States was unable to accept the codification of private international law presented to the Conference because it was deemed to constitute such regulation of the internal affairs of nations as under our Constitution is reserved to the component states. The question of arbitration of international disputes, which came before the Conference, was deferred for discussion at another conference to be held at Washington in December.

Costa Rica and Monroe Doctrine.—In connection with the relations of the United States to the Latin-American nations, mention should be made of the action of Costa Rica, who, in replying to a communication from the League of Nations urging her to reconsider her decision to withdraw from the League, indicated her desire "to know the interpretation placed by the League of Nations on the Monroe Doctrine, and the scope given to that Doctrine when it was included in Article 21 of the Covenant of the League."

Hoover Good-will Tour.—In this connection should also be mentioned the good-will tour of President-elect Hoover to the countries of Central and South America, which seems likely to have important effects in promoting friendly relations between the United States and those countries visited.

THE UNITED STATES AND NICARAGUA

Fighting Stopped.—During the year the opposition of the rebel general Sandino, to the occupation of Nicaragua by American marines was gradually overcome through the airplane bombing operations of our considerably augmented forces. In accordance with the Stimson agreement of 1927, the contending forces of the Liberal and Conservative parties were disarmed and preparations were made for the holding of the presidential election.

Election Supervision.—The Liberals nominated General Moncada as their candidate for president, while the candidate of the Conservatives was Señor Benard. In September and October registration took place under the protection of American marines and the Nicaraguan National Guard, who prevented efforts of disaffected elements to intimidate the voters. The result was a largely increased registration. The election was held on November 4th under the supervision of a board of which Brig. Gen. F. R. McCoy, U.S.A., was chairman. Approximately 132,000 votes were cast. Gen. Moncada, the Liberal candidate, was elected by a large majority. This was probably the fairest election ever held in Nicaragua. So successful was the plan of American supervision of the election that the leaders of both the parties were reported as favoring American supervision of the election to take place in 1932. The administration at Washington, however, has as yet refrained from committing itself to this undertaking.

THE UNITED STATES AND CHINA

Nanking Settlement.—The Nanking outrage of March, 1927, was settled a year later through the efforts of American Minister MacMurray. The Nationalist Government expressed regret for the incident and agreed to pay damages as determined by the Sino-American claims commission.

Treaty Revision.—Thereafter the Nationalist Government requested that plenipotentiaries be appointed to negotiate a general revision of American treaties with China. In response to this request, Secretary Kellogg dispatched a note, dated July 24, to the Nationalist Government in which, among other things, he said: "I am impelled to affirm my belief that a new and unified China is in process of emerging from the chaos of civil war and turmoil which has distressed that country for many years. . . . The American Government is ready to begin at once negotiations with properly accredited representatives whom the Nationalist Government may appoint, in reference to the tariff provisions of the treaties between the United States and China with a view to concluding a new treaty in which it may be expected that full expression will be given reciprocally to the principle of national tariff autonomy. . . ."

New Tariff Treaty.—On the following day such a treaty was signed in Peiping (Peking) between American Minister MacMurray and the Chinese minister of finance. The new treaty annuls all provisions of previous treaties between the two countries "relating to rates of duty on imports and exports of merchandise, drawbacks, transit dues and tonnage dues in China" and substitutes therefor the principle of national tariff autonomy. It also undertakes to guarantee our citizens against discriminations. The United States made this treaty on its individual responsibility and thus in this instance departed from the principle of coöperation with other powers which it had hitherto in the main followed towards China. It is to be noted that no provision was inserted in this treaty and no move was made at this time by our Government relating to the abolition of extraterritoriality, so that this particular grievance of China remains for the present unsettled.

Recognition of Nationalist Government.—In September, the State Department announced that it regarded the negotiation of the tariff treaty, even though the Senate had not yet approved it, as constituting *de jure* recognition of the Nationalist Government of China. Here again, as in the case of the non-recognition of Russia

in spite of her adherence to the Kellogg anti-war pact, the State Department apparently considers the matter of recognition to depend on the intention of our Government. As a result of the settlement of the affairs of China and our recognition of her Government, trade with her is increasing and it has been found practicable to withdraw a considerable body of our marines from that country.

LATIN-AMERICAN RELATIONS

By Graham H. Stuart

Professor, Stanford University

Sixth International American Conference.—The year has been notable for the many important developments in the relations between the nations of the western hemisphere. But the outstanding event was the Sixth International American Conference which met January 16 to February 20 in Havana. Coming at a time when the United States was being severely criticized for intervention in Nicaragua, President Coolidge went to Havana to proclaim in person the friendliness of the United States towards all Latin America. The most eminent delegation ever sent to an inter-American conference represented the United States. Headed by former Secretary of State, Charles E. Hughes, it included Henry P. Fletcher, ambassador to Italy; Dwight W. Morrow, ambassador to Mexico; ex-Senator Oscar W. Underwood, Dr. James Brown Scott, Dr. Ray Lyman Wilbur, and Dr. L. S. Rowe. All the twenty-one republics were represented.

Agenda of the Conference.—The agenda included a plan for the reorganization of the Pan-American Union, the codification of public and private international law for the American states, the improvement of communications including aviation and automotive traffic, increased intellectual cooperation and numerous questions of social welfare and health. Although contentious political subjects seemed to have been avoided, the project for the reorganization of the Pan-American Union provoked an animated discussion and the Latin-American states succeeded in "dis-diplomatizing" it by providing that henceforth a state might be represented on the governing board either by its regular diplomatic representative at Washington or by a special representative. Also it was decided that henceforth the Union should rest upon the basis of an international convention instead of upon resolutions of successive conferences as had hitherto been the case, although the Union still rests upon a resolution of the Conference until the convention shall be unanimously ratified. An attempt of the Argentinian delegate to include a statement urging the leveling of tariff barriers was opposed successfully by the United States as well as an attempt to give the Union political powers. The suggestion that the position of Chairman and Director-General be annually rotated was also voted down.

Political Questions. — The other cause of serious disagreement occurred in the consideration of the codification of public international law. Article 3 of the project declared that "no state may intervene in the internal affairs of another." With the American marines actively engaged in Nicaragua the subject possessed more than academic interest. The United States made a distinction between political intervention for permanent possession and temporary interposition for humanitarian and other limited purposes. After a spirited debate in the course of which Mr. Hughes made his most important speech on American policy of non-aggression, the question was postponed till the next conference scheduled to meet in Montevideo in 1932. Closely connected with this subject was that of compulsory arbitration

and the Conference finally passed a resolution condemning war as an instrument of national policy in their mutual relations and agreeing to meet within a year in Washington in a Conference of Conciliation and Arbitration to give realization to the principle.

Utilitarian Questions.—In questions of a less political nature the Conference made signal progress. An excellent codification of private international law was approved, an aviation convention for the regulation of aircraft communication between the American republics was accepted, a treaty defining the status of aliens abroad drawn up and the copyright convention was revised. Numerous resolutions were approved regarding improved communications, better health and for the encouragement of more complete intellectual cooperation. On the whole the conference was successful if for no other reason than for the opportunity which it gave for a frank and public interchange of opinion, and the majority of South American newspapers expressed most favorable opinions regarding its achievements. H. L. Menken in the Baltimore *Sun* and Manuel Ugarte in *L'Europe Nouvelle* were less flattering.

Conference on Conciliation and Arbitration.—In accordance with the resolution of the Havana Conference the United States issued an invitation to the twenty Latin-American Republics to meet in Washington on December tenth to draw up an obligatory arbitration agreement. Secretary of State Kellogg and Charles E. Hughes were appointed to represent the United States. When the delegates came together they were faced with an outbreak between Bolivia and Paraguay over the Gran Chacó boundary question. A resolution was passed unanimously urging a peaceful settlement and a committee appointed to act in a mediatory capacity. On December 14 the Conference decided to offer its good offices to Bolivia and Paraguay, and three days later it had secured the acceptances of both. As the year closed the Conference was working on a solution for the Bolivia-Paraguay dispute as well as discussing the terms of an obligatory arbitration treaty for the states of the western hemisphere. The details of this conference are elsewhere discussed in this volume.

PERSONAL RELATIONS

Lindbergh Good Will Flight.—It will be remembered that Colonel Lindbergh left on his famous good will trip from Washington to Mexico City Dec. 13, 1927. His visit to Mexico was so successful that he was persuaded to continue through the Caribbean Republics. He left Mexico for Guatemala Dec. 28, thence Dec. 30 for British Honduras and on New Year's day he was in San Salvador. Thereafter, in order, he visited Honduras, Nicaragua, Costa Rica and Panama. Although he had originally planned to return from Panama to Yucatan he was persuaded to extend his trip to Colombia and Venezuela. He left Panama for Castagena, Colombia, Jan. 26, thence to Bogota on the 27th and to Maracay, Venezuela, Jan. 29. On his return flight he visited Virgin Islands, Porto Rico, Santo Domingo, Haiti and Cuba, arriving at Havana during the Sixth Pan-American Conference. As a gesture of sincere friendliness it has never been surpassed either in method or results.

The Hoover Trip.—An even more remarkable voyage in some respects was that of President-elect Herbert Hoover to Latin America for the purpose "of laying a basis for personal relations between himself as the next President of the United States and the leaders and governments of these countries, and for mutual assistance in dealing with problems that confront them." Traveling upon the battleship *Maryland*, the flagship of the Pacific fleet, and accompanied by H. P. Fletcher, American Ambassador to Italy, Mr. Hoover left San Pedro, Calif., Nov. 19, visited the states of Central America *en route*, thence down the west coast to Peru and Chile. Crossing the Andes, he returned stopping at Argentina, Uruguay and Brazil. The visit to Buenos Aires was most important owing to the general

attitude of aloofness maintained by the Argentine government toward the United States. It was here that Mr. Hoover declared that "the fear of some persons concerning supposed intervention ideas of the United States are unfounded. The facts are gradually demonstrating more clearly and more fully that in my country there prevails no policy of intervention despite any appearance of such intention." It remains to be seen what effect the trip will have on the Argentine opposition to the Kellogg Peace Pact and to the high tariff policy of the United States.

MEXICO

The Oil Settlement.—The long drawn out dispute between the United States and Mexico over the provisions of Article XXVII of the Mexican Constitution of 1917 and the Petroleum Law of 1925 putting it into operation seems finally to have been settled during 1928. On Dec. 27, 1927, at the request of President Calles, the Mexican Congress passed an act amending the previous law so as to confirm all rights derived from lands where contracts for exploitation had been entered into previous to May 1, 1917, by issuance of concessions for an indefinite time instead for a fifty-year period. The law was effective as of Jan. 11, 1928, and on March 27, 1928, President Calles signed regulations for the validation of such titles, providing some positive act of exploitation had been performed prior to May 1, 1917. As this was in accord with the agreements of 1923 between the United States and Mexico, the difficulty seemed to have been definitely settled.

During the next month various oil companies including the Huasteca Petroleum Company, the largest foreign oil company operating in Mexico, El Ageula Oil Company, La Corona Petroleum Company and the Mexican Sinclair Petroleum Company accepted the new regulations. On May 3, the Mexican Minister of Industry, Commerce and Labor after reviewing the oil controversy declared that the "decree should put a full stop to the controversy which had arisen since the promulgation of the Constitution of 1917."

A settlement of the problem regarding the ownership of land also seemed to be indicated by an authorized statement issued September 13 to the effect that Mexican corporations devoted to other purposes than those of agriculture, even if controlled partly or wholly by foreigners, may acquire lands within and without the prohibited zones specified in Article XXVII of the Constitution of 1917 provided the Ministry of Foreign Relations gives consent.

Boundary Settlement.—On June 19 the State Department at Washington announced that the American Mexican International Boundary Commission had settled the nationality of forty-two tracts of land whose nationality had become uncertain by the action of erosion and avulsion of the Rio Grande River. As long as their nationality was undecided, property rights could not be established, nor taxes collected, and as a sort of no man's land these districts had become a favorite refuge for criminals.

NICARAGUA

Gen. McCoy as Election Supervisor.—Of the Caribbean area Nicaragua again gave most concern to the U. S. Department of State. Under the Stimson agreement of 1927 both Liberals and Conservatives had agreed to an election under the supervision of the United States. President Coolidge nominated Gen. Frank R. McCoy as Chairman of the National Board of Elections, an officer with long experience in Cuba and Central America. In order to hold a fair election it was felt necessary that the Nicaraguan Congress pass a law giving the Board of Elections dictatorial powers. President Diaz and the Liberals favored such a measure and it passed the Senate but in the Chamber the Chamorristas succeeded in killing it: General McCoy was not turned from his purpose and it was finally contrived that President Diaz should issue an executive decree granting the necessary powers drawn in such a way as not to overstep his authority under the Constitution.

Diaz Amnesty Decree.—As a possible means of restoring peace to the country before holding the elections President Diaz issued a decree Aug. 11, promising unconditional amnesty to all organized groups guilty of armed opposition since May 25, 1927, provided they would surrender by Sept. 15. It was claimed that over 1,600 Sandistas had surrendered by the first of September. From that time on Sandino and his followers ceased to be a disturbing factor.

U. S. Marine Force.—In order to make sure of a peaceful election Gen. McCoy requested 1,000 additional marines, bringing the total number up to 5,000. He thereupon sent observers to the various departments of the country to inform the voters that intimidation would not be tolerated and that the election would be "free, just, and impartial." President Diaz gave the election board authority to supervise telegraph and telephone lines during registration and election and to control the sale of liquor.

No announcement was made by the State Department as to when the marines are to be withdrawn. In reply to the request by the Senate, Secretary of the Navy Wilbur declared on April 17 that the cost of the marines in Nacaragua from May 4, 1927, to April 16, 1928, was $3,536,000, or $1,530,170 more than if they had been kept at home. He further stated that twenty-one marines had been killed and forty-five wounded.

Election Results.—Registration was held on five different days commencing September 23 and ending October 7. The Conservatives, in spite of the opposition of President Diaz, nominated Adolfo Bernard, an adherent of General Chamorro. The Liberals agreed upon General Moncada, former leader of the Liberal forces. In the election which took place on November 4, the United States had officers at every one of the 351 voting booths and the counting of votes was carried out by Americans. As a precautionary measure the National Board of Elections decided to mark with a chemical stain the hand of every voter as he cast his ballot. The elections took place in a peaceable fashion, almost 90 per cent of the registered vote being cast. General Moncada, the Liberal candidate, won by a majority of 19,471 votes out of a total of 132,494. On Dec. 15, Gen. McCoy certified the results of the election to the Nicaraguan Congress and handed in his resignation.

The *Prensa*, leading Conservative newspaper, said of the election: "With unrestricted freedom the Nicaraguan citizens went to the polls under American supervision . . . the Liberals obtained the victory in a democratic struggle." The *Commercio*, a Liberal organ, declared: "This election, free from tears and sorrow, the like of which has never before been seen in the annals of our country, places Nicaragua in line with the world's advanced nations."

U. S. Investments in Nicaragua.—Considering the many accusations of dollar diplomacy leveled at the United States it is interesting to note that a *New York Times* investigator found the total investment of Americans in Nicaragua to be approximately $12,000,000, of which about $10,000,000 was invested in bananas and timber on the east coast and Wall Street could only be credited with about $185,000.

THE OTHER CARIBBEAN REPUBLICS

Cuba.—The Platt Amendment received a certain amount of attention during the course of the year. On April 17 Senator Shipstead introduced a resolution instructing the Foreign Relations Committee to investigate whether property and rights of American citizens in Cuba and liberties of the Cuban people were being fully protected under the Platt Amendment. On the following day the Cuban Embassy declared that it knew of no claims of American citizens against the Cuban Government and furthermore an investigation by the United States Senate could not be carried on in Cuba.

On the occasion of the Convention of the Spanish War Veterans held in Havana, October 8, President Machado declared that Cuba would welcome the repeal of the Platt Amendment to her constitution inasmuch as her evo-

lution had made the amendment "morally non-existent." However, he further suggested that the initiative should come from the United States. A Washington dispatch said that President Coolidge had no comment to make on President Machado's suggestion.

Honduras.—Secretary Kellogg proposed to Honduras and Guatemala in June that they submit their boundary dispute to the International American Court set up by the Washington treaties of 1923. Guatemala accepted but Honduras refused although declaring her willingness to accept arbitration by the President or Chief Justice of the United States. A second note to Honduras dispatched by Secretary Kellogg in August was equally unsuccessful and was bitterly denounced by the Honduran press.

Panama.—The intention of the United States to supervise elections in Nicaragua evoked an echo in Panama when the Conservative party asked the United States to intervene under the right provided by Article 136 of the Panamanian Constitution. Secretary Kellogg, replying on July 27, declared that the representations made and the documents submitted did not convince the Department that sufficient grounds existed to authorize intervention. He declared that it was the duty of the Panamanian Government to conduct a free and fair election, and the United States would maintain an attitude of absolute impartiality between the two parties. The Liberal party was retained in power.

Costa Rica provoked considerable discussion when in reply to the invitation of the Council of the League of Nations to reenter the League she requested from the Council an "express and authorized declaration with regard to the actual scope and correct interpretation" of the Monroe Doctrine inasmuch as by Article 21 of the Covenant the doctrine had become "a constituent part of American public law." In a reply dated Sept. 1, the Council declined to do so on the ground that such a task only concerned those states that had accepted *inter se* such engagements. Nevertheless, the Council declared that the Doctrine was not incompatible with any article of the Covenant nor did it weaken nor limit any safeguard provided in the Covenant.

SOUTH AMERICA

Colombia.—A situation somewhat resembling that with Mexico developed between the United States and Colombia when the Colombian Government passed laws requiring owners of land to submit all their titles to the government for examination, or else forfeit their holdings. Apparently the Barco Concession, comprising five million acres of oil lands belonging mostly to a group of American financiers, did not possess satisfactory title. When a memorandum to the Colombian Government failed to obtain satisfaction, United States' aid was invoked. As yet the American Government seems to have limited its intervention to asking information regarding the status of negotiations between the Colombian Government and the oil interests.

Through the good offices of the United States a twenty-five year old dispute between Colombia and Nicaragua over the sovereignty of the Mosquito Coast and the St. Andrew and Providence Islands was settled by a treaty between the two governments signed at Managua, March 24.

The Peru-Chile Controversy.—After seventeen years of severed diplomatic relations owing to the Tacna Arica dispute, Peru and Chile through the good offices of Secretary Kellogg agreed on July 13 to resume friendly relations. On Oct. 3 President Leguia of Peru received the Chilean Ambassador at Lima and two days later the Peruvian Ambassador was received at Santiago. The same month the Tacna Arica Boundary Commission suspended activities for four months pending direct negotiations looking towards a full settlement between the two countries.

ORIENTAL AND NEAR EASTERN RELATIONS OF THE UNITED STATES

By Albert Howe Lybyer

Professor of History, University of Illinois

CHINA

Kuomintang in Control.—Outstanding events in the Far East in 1928 were connected with the advance of the Nationalist or Kuomintang Party to the control of China proper and the beginning of its recognition as the effective and presumably permanent governing power. In December, 1927, after a comparative standstill of six months, activities began. Chiang Kai-shek met again with the Central Executive Committee of the Kuomintang. It was arranged to reconstitute the Cabinet at Nanking. The Communists at Canton revolted Dec. 11th. The outbreak was promptly crushed. As a consequence the Nationalists broke off diplomatic relations with Russia on the ground that the Soviet consulates and state commercial agencies had been used as headquarters for Red propaganda and as asylums for Communists.

The Central Executive Committee, at its fourth session in Shanghai, Feb. 3, ordered the suppression of radical tendencies, general conciliation, and an effort to revise treaties favorably to China. At this time the Nationalists claimed control of 16 out of 21 provinces, and declared that all foreign loan obligations secured on the customs had been paid to the end of 1927. Chiang Kai-shek was again commander-in-chief, with the cooperation of the other Nationalist leaders. On March 30 terms of settlement were reached with the United States for the troubles at Nanking in March, 1927. China expressed regret for the injuries done and promised compensation through a joint commission.

Advance on Peking.—In April Generals Yen, Feng, and Chiang set their armies, numbering about 300,000 men, in motion toward Peking. Despite repeated protests from both the Nationalist and the Chang Tso-lin governments, the Japanese sent 6,000 troops to Tsinan, the capital of Shantung, to protect their nationals and property. As a result, when early in May the victorious Nationalist troops entered the city in large numbers, a clash occurred and fighting continued several days. The incident led to an exchange of stiff notes and a general attitude of suspicion between the two countries which lasted through the year. The Nationalist advance was not seriously delayed. On June 3 the Dictator, Chang Tso-lin, withdrew from Peking, and General Yen occupied the city June 5. Chang Tso-lin's train was blown up as he entered Mukden. He was fatally injured, and died soon. His son, Chang Hsueh-liang succeeded him in the control of the three Eastern provinces. Disorders continued for some months east of Peking, but ultimately all forces yielded to the Nationalists. Government archives were moved to Nanking, and the name of Peking (North Capital) was changed to Peping (North Peace).

Tariff Autonomy Treaties.—On July 25 the American Minister MacMurray and the Chinese Finance Minister Soong signed a treaty, looking forward to complete tariff autonomy for China, to become effective Jan. 1, 1929, or four months after ratifications should have been exchanged, provided other nations should also consent. This treaty carried *de facto* recognition of the Nationalist Government, and was interpreted two months later by the State Department as involving *de jure* recognition. A note of Secretary Kellogg, July 26, seemed to promise the immediate negotiation of a new commercial treaty, but this was later interpreted as referring to the treaty of July 25.

On Dec. 19 a Sino-British treaty for tariff autonomy was signed at Nanking, and on the following day the British Minister, Sir Miles Lampson, formally presented his credentials to President Chiang Kai-shek. Most of

the other powers have signed similar treaties. Italy, Belgium, Spain, Denmark and Portugal promised to relinquish extra-territorial rights by Jan. 1, 1930.

Clashes with Japan.—Relations with Japan were not cordial. Premier Tanaka held control of Tsinan, and prevented the repair of a bridge on the main line between Tientsin and Shanghai. On May 18 he insisted that Japan would maintain peace and order in Manchuria. The Nationalist Government objected to such a policy as an interference in China's domestic affairs. After the fall of Peking, Tanaka advised Chang Hsueh-liang not to join the Nationalists or to use their flag. Evidently an attempt of the Nationalists to send troops into Manchuria would have led to war with Japan. On July 20 C. T. Wang, then foreign minister, notified the Japanese Government that the commercial treaty between the two countries was no longer in effect. Tanaka replied sharply that China had no right to abrogate the treaty, but that Japan would negotiate for a revision. The document ended with a threat of force. The Nationalist Government replied mildly and in practice continued temporarily the application of the treaty.

Settlements with Foreign Powers.—On August 9 an agreement with Britain was signed to settle the Nanking incident of 1927. Later the British and American consulates were reopened in Nanking. Settlement was also made with Italy and France.

Organizing the New Government.—Important forward moves were made in October, the seventeenth anniversary of the proclamation of the Chinese Republic. Chiang Kai-shek was elected by the Central Executive Committee "President of the Government of China." This was regarded as filling the vacant office of President of China. Five Yuans or Boards were constituted, each with a president, for administration, legislation, examination, supervision, and justice. In addition ten ministers and four committees were provided for, all the members to be appointed, since the time for popular election was felt not to have arrived. A State Council was instituted, on which Chang Hsueh-liang was given a position. A new criminal code was put into effect. American and German technical advisors were chosen. A Central Bank of China was organized with a capital of $20,000,000 (Mexican). An autonomous tariff schedule was put into effect Feb. 1, 1929. The Foreign Minister sent identic notes to the powers, requesting action toward the abolition of extra-territoriality.

Missionary Work Resumed.—The work of American missionaries in China was rapidly resumed during the year. The general American attitude was to request the surrender of mission properties which had been appropriated to Chinese use, without, however, presenting claims for damages, or encouraging such claims on the part of individual missionaries.

Unemployment and Famine Problems.—At the close of the year serious problems of adjustment and reconstruction confronted the government. Great numbers of soldiers must be disbanded, whereas the prolonged civil war had led to serious unemployment in various regions. Under Japanese protection vast numbers of inhabitants of Shantung were passing over to colonize Manchuria. Nevertheless, Shantung and other provinces contained large famine areas. The government was attacking the problem in various ways, such as by road and railroad building and the seeking of foreign loans for famine relief.

Manchuria Yields to Nanking.—On Dec. 29 the Manchurian Government announced that it would fly the Nationalist flag officially. Japanese Consul General Hayashi at Mukden stated that Japan "does not intend to intervene in political and administrative reforms in Manchuria." Chang Hsueh-liang announced that the policies of Nanking were now "identical with those of Manchuria, and therefore it was decided to accept Nanking's authority, making the unification of all China a reality." The ruling body in Manchuria received the name of Northeastern Frontiers Defense Commission.

JAPAN

Parliament Elected by Universal Suffrage.—On account of the crucial conditions in China, Japan received less attention during the year than was her due. The Emperor was enthroned, the heir-presumptive was married, a parliament was elected by universal suffrage, and important legislation was considered. The 54th session of parliament was opened Dec. 26, 1927. On Jan. 21 Premier Tanaka dissolved the lower house. The election was held Feb. 20. The 12,000,000 voters included all males over twenty-five years of age except paupers, active members of the army and navy, and heads of noble houses. The voting was direct and by secret ballot. The Seiyukai party, that of the Premier, proposed a "positive" policy of government aid to finance and industry, and full protection of Japan's rights in China. The Minseito party, which had a slight majority in the old parliament, was for retrenchment and a moderate foreign policy. The new Diet convened Dec. 24 in the 56th session since the foundation of parliament in 1890, and was formally opened by the Emperor Dec. 26. The budget prepared for it called for about $816,000,000, representing a moderate increase over that for 1928 of about $20,000,000.

TURKEY

Pre-War Ottoman Debt.—Negotiations were completed for settlement of that portion of the pre-war Ottoman debt adjudged by an international commission to rest properly upon Turkey. During the first seven years Turkey is to pay in gold $8,800,000 annually, and the sum is to rise gradually until from June, 1951, the payment will amount to about $15,000,000 annually. This scheme was ratified in November, and the first payment made. The annual budget of Turkey has advanced to $110,000,000 per year, of which one-third is paid out directly for national defense.

Substitution of Latin for Arabic Alphabet.—During much of the year the government, led by the President, Mustapha Kemal Pasha, engaged in the most active possible exertions to carry through the substitution of the Latin (slightly modified) for the Arabic alphabet for writing and printing the Turkish language. The process was much accelerated beyond the original intention. Schools were ordered to teach the new system and newspapers to use it. Government officials were given short periods to begin the use of the new alphabet in all official work. Vigorous efforts were made to teach the new system to adult illiterates.

American Schools.—Early in the year permission was granted to reopen the American school for boys at Sivas, as well as a vocational school at Merzifun. The American school for girls at Brusa, however, was ordered closed, and three of its teachers were put on trial on the charge of illegal religious propaganda. It was maintained that religious ideas must not be taught to persons under eighteen. The American teachers were convicted and sentenced to small fines and nominal terms of imprisonment. They appealed to a higher court and a new trial was ordered and held, which resulted in the same sentence and another appeal was taken. The American colleges at Constantinople and Smyrna have been well attended, mostly by Turkish students.

EGYPT

English Treaty Rejected.—Parliament opened Nov. 17, 1927, and proceeded to function normally in cooperation with Prime Minister Sarwat Pasha. During the previous summer Sarwat had negotiated a draft treaty in England, which was not made public before March, 1928. The Wafd or Delegations Party, commanding a voting majority in Parliament, rejected the draft treaty because it did not sufficiently protect the independence of Egypt, and on March 4 Sarwat Pasha so notified the British Government and immediately presented his Cabinet's resignation to King Fuad. Mustapha Nahas Pasha, leader of the Wafd, formed a coalition Cabinet of the Wafd and Liberal Parties. The British Government ob-

jected to certain measures that were before Parliament, on the ground that these abused the protection of life and property in Egypt. The new Cabinet replied, objecting to British interference in the internal affairs of Egypt. The British reiterated their demand, quoting the four points which were reserved in the Declaration Concerning Egypt of 1922. British warships were ordered to Egyptian waters, and April 29 the British issued an ultimatum, to which the Egyptian Government replied by postponing the offending bills to the next session of Parliament.

Cabinet Troubles.—In June, two Liberal members of the Cabinet resigned, and were followed by some Wafd members. The press exposed Nahas Pasha and two other prominent politicians as having taken a legal case on a contingent fee. It was affirmed that they were proposing to use their political position to obtain a favorable decision. On June 24 the King requested the Cabinet to resign, and on refusal he dismissed it. Mohammed Pasha Mahmud was invited to form a Cabinet. He chose Liberals and moderate Wafd members, thus far proceeding constitutionally. On June 28, however, he adjourned Parliament for one month, and on July 19 a royal decree suspended Parliament and the elections for three years. This was clearly unconstitutional. The British were accused of suggesting it, which was officially denied. Members of the dismissed Parliament met on July 28, and again on the constitutional date of reassembly in November, and passed resolutions against the unconstitutional action of the Cabinet.

SYRIA

In February M. Ponsot, French High Commissioner, announced arrangements for election of a Constituent Assembly. Damad Ahmed Namy Bey, for two years President of Syria, resigned. A new position, Head of the Provisional Government, was created, and to this was appointed Sheikh Tajeddin, formerly Kadi of Damascus. Martial law was abrogated at Damascus, and a general amnesty, with certain exceptions, was granted. The newly elected assembly met June 9. M. Ponsot promised that a treaty would be made with France after a constitution within the terms of the mandate should have been elaborated. A draft constitution was submitted to the High Commissioner, who objected to several articles, on the ground that their spirit of independence was inconsistent with the mandatory control which had been intrusted to France by the League of Nations. The Assembly refused to change these articles: M. Ponsot suspended the sessions for six months, and went to Paris for consultation.

PALESTINE

An important missionary conference, attended mainly by representatives of Protestant denominations from Asia and Africa, was held at Jerusalem, March 24-April 8. Organizations drawn from the Moslem majority of the population continued peaceful agitation for a constitution and a parliament whose members should be chosen in proportion to religious groupings. On Sept. 24, the Day of Atonement at the Wailing Wall, the local police interfered and removed a screen which had been built to separate the male and female worshipers. There followed a heated controversy in Palestine and elsewhere involving the fairness of the control by the Mandatory Power. Differences of opinion appeared in the Zionist Organizations in America and Europe as regards relationship to the British Government, policies, and financial administration. General Lord Plumer's term as High Commissioner ended in July. He was succeeded by Sir John Chancellor.

ARABIA

Negotiations continued with England through much of the year on account of the Wahabi raids into Iraq late in 1927. A conference was held at Jedda beginning in April between King Ibn Saud and Sir Gilbert Clayton. After interruption during the month of pilgrimage, it was resumed, but broke up on August 9th without agreement, the chief obstacle be-

ing the King's refusal to approve the building of police posts by Iraq near the common frontier. A conference held at Haifa in July with regard to regulating the use of the Hejaz railway, part of which is in Syria, part in Trans-Jordan, and part in Ibn Saud's kingdom, likewise broke up without agreement. The King asked the Swiss Government earlier in the year for specialists in postal, telegraph, wireless telegraph, customs, and quarantine services.

PERSIA

In accordance with the announcement of May, 1927, the Persian Government on May 10 declared the abrogation of the Capitulations, and signed a treaty with Great Britain which recognized the end of extraterritoriality for foreign citizens in Persia and the right of Persia to tariff autonomy. During the next few days treaties, accords, and notes arranged the transition out of the capitulatory régime with the United States, France, Germany, Belgium, and Italy. The elimination of American advisers proceeded, their place being taken by Germans and Swiss. In the autumn Persia was honored by being chosen to a non-permanent seat on the Council of the League of Nations.

During the year the route was established for the new railway from the Persian Gulf through the capital to the Caspian Sea, and contracts were let for beginning the work. The wheat crop was unusually good in the north, and the resumption of normal commercial relations with Russia led to improved conditions generally. Cautious steps were taken toward the liberalization of education and improvement in the position of women.

AFGHANISTAN

King Amanullah and Queen Suriya made an extensive tour during the first part of the year. They visited Egypt, Italy, France, England, Germany, Russia, Turkey, and Persia. Upon returning the King set in motion a process of thoroughgoing westernization. A ministry and parliament were instituted, western costumes are to be adopted, women are to appear with faces unveiled, education is to be transformed, advisers have been received from Turkey, and students have been sent to Turkey. Much dissatisfaction resulted among conservative elements of the population, which culminated in the revolt of certain tribes. At the end of the year an active state of civil war was in progress. The government appeared to be gaining, but peace seemed conditioned on a compromise as regards the speed of westernization.

INTERNATIONAL CONFERENCES

By Raymond L. Buell

Foreign Policy Association

SIXTH PAN-AMERICAN CONFERENCE

Conventions. — Undoubtedly the most important international conference in which the United States participated in 1928 was the sixth Pan-American Conference, held at Havana last January, the details of which are elsewhere discussed in this book. This Conference adopted eleven conventions, eight of which dealt with the codification of international law: a convention on commercial aviation; a convention giving a juridical basis to the Pan-American Union; and a convention revising the Copyright Agreement of 1910 were also signed.

Debates.—Vigorous debates took place over the status of the Pan American Union, and over the questions of tariff and intervention. Mexico took the lead in attempting to reduce the influence of the United States in the Pan-American Union; Argentina took the lead in attacking indirectly the United States tariff; Argentina and Salvador led in the campaign for non-intervention.

Status of Pan-American Union.—In the convention in regard to the Pan-American Union, it was provided that the governments may appoint to the Governing Board such representatives as they desire, whether or not they are diplomats accredited to Washington. The Director-General of the Union may attend Pan American Conferences in an advisory capacity. The Pan-American Union shall not exercise any political functions. The Conference imposed upon the Union the duty of calling in the future fourteen conferences, most of which are of an educational, commercial, or cultural nature.

Tariffs.—In the debate, Argentina declared that a statement should be made in the convention condemning excessive tariffs. This proposal was opposed by the United States and other governments, and the upshot was the resignation of M. Puerrydon, the Argentine representative.

Foreign Intervention.—Most vigorous controversy arose over the article in the proposed codification of public international law that no state should intervene in the internal affairs of the other. M. Maurtua of Peru proposed that this article which had been drafted by a body of jurists at Rio should be set aside in favor of a declaration of the rights and duties of nations. He was supported by the United States. Thirteen states, however, made strong declarations in favor of the principle of non-intervention. Agreement proving impossible, a committee recommended that the question be postponed until the Seventh Conference. The question, however, was reopened in the plenary session of February 18. Mr. Hughes vigorously opposed the non-intervention speakers. He declared that a government was fully justified in taking action to protect the lives and property of its nationals. The Conference thereupon passed the motion to postpone the question.

Means to Avoid Conflict.—Before adjourning the Conference passed two important resolutions, the first of which declared that all aggression is considered illicit and is prohibited, and that the American States will employ all pacific means to settle conflicts which may arise between them.

The second provided that the American Republics would meet in Washington in a conference of conciliation and arbitration.

PAN-AMERICAN ARBITRATION AND CONCILIATION CONFERENCE

Bolivia-Paraguay Case.—This Conference opened in Washington in December, 1928. It was immediately confronted with the threatened outbreak of hostilities between Bolivia and Paraguay. As a result of telegrams from the League of Nations and from the Pan-American Conference hostilities were averted, and both governments agreed to sign a protocol drawn up at the conference referring the boundary incident which had caused the dispute to a commission of nine members.

Arbitration and Conciliation Treaties.—Thus impressed with the necessity of some permanent conciliation machinery the Pan-American Conference proceeded to draft and sign two very important treaties; the first is a Pan-American arbitration treaty which provides for the arbitration of all legal disputes. These are defined to include questions arising out of the interpretation of treaties and international law—an article based upon the optional clause of the World Court statute. The only exceptions from arbitration are domestic questions and matters affecting states not party to the treaty. States, however, may make reservations at the time of signature. The conciliation treaty revises the Gondra Convention of 1923. It provides that the permanent diplomatic commissions at Montevideo and at Washington shall not only undertake the formation of *ad hoc* commissions of inquiry, authorized in the 1923 convention, but at their own discretion may themselves immediately undertake the task of conciliation in case of threatened conflict.

LEAGUE OF NATIONS PREPARATORY DISARMAMENT COMMISSION

Fifth Session.—The United States was officially represented at the fifth

session of the League of Nations Preparatory Commission for the Disarmament Conference which was held at Geneva, March 15-24, 1928. Hugh Gibson, United States Ambassador to Belgium, headed the delegation. Mr. Gibson has represented the United States at all previous sessions of the Commission.

Representation.—The Preparatory Commission is the coordinating agency for the disarmament work of the League and is specially charged with preparing the ground for a general disarmament conference. It held its first session in May, 1926. The fifth session, which was the only one held in 1928, was attended by a representative of Turkey for the first time. The Union of Socialist Soviet Republics was represented for the second time.

Russian Proposals.—This session of the Preparatory Commission was for the most part given over to discussion of Russian proposals for the complete abolition of all land, naval and air forces, which had been introduced by the representative of the U. S. S. R. at the fourth session of the Commission in December, 1927. M. Litvinoff, head of the Soviet delegation, stated that it was the view of his government that nothing but general, simultaneous and complete disarmament was capable of satisfactorily solving the problem of general security and peace. He said further that the Russians felt entitled to count on special support of this plan "from the delegation of that government which is now making a proposal for the prohibition of war."

Cushendun's Accusations. — The debate in the Commission on the Russian proposal was long and acrimonious in tone. In all, nineteen speakers presented their views, Lord Cushendun of Britain making the most detailed and scathing speech. He accused the Russians of coming to Geneva after seven years of reviling and deriding the League's disarmament work, only to sabotage the League itself. He then pointed out that the Soviet proposal was not compatible with the terms of the Covenant and asked the Russian delegates point blank whether they "set their face against civil war, i.e. revolution, as against international war." Lord Cushendun ended his speech by intimating that the purpose of the Russian proposal was to remove obstacles to world revolution in bourgeois countries.

Gibson's Reply to Litvinoff.—The other members of the Preparatory Commission criticized the Soviet plan with varying degrees of harshness. Mr. Gibson replied to M. Litvinoff in regard to the relation of the outlawry of war negotiations which were going on at that time, and the Russian disarmament scheme. He explained that it was on grounds of sincerity that the United States supported one proposition and not the other. "Drastic proposals for immediate and complete disarmament . . . we do not believe are calculated to achieve their avowed purpose. . . . We have always stated our conviction that, as we build up the will for peace and confidence in peaceful methods for settling international disputes, . . . our need for armaments will automatically decrease."

Litvinoff's Retort.—M. Litvinoff replied in sarcastic vein to Mr. Gibson, saying that criticism of the Soviet proposal had been based on a profound assumption "that a solemnly accepted international convention is bound to be infringed, while, when two neighbors, armed to the teeth, give a solemn promise not to attack each other, only then can the preservation of peace be hoped for. But when these neighbors supplement their solemn promise by undertaking to disarm and by actually disarming, we are told that not only will this not increase for them both the existing security, but it will actually decrease it. Thus, we learn disarmed nations are still more dangerous to each other than armed!"

"Partial Gradual Disarmament."—The discussion showed clearly that the Russian proposals stood no chance of being accepted, and faced with this fact, the Russian delegation introduced a new scheme into the Commission providing for "partial gradual disarmament." This, the So-

viet delegation stated, it would regard "as the first stage on the way to total disarmament." This proposal was referred to the Governments without discussion in the Commission.

Effort to Break Deadlock.—The fifth session of the Preparatory Commission brought out the fact that France and Britain were carrying on private conversations with a view to breaking the deadlock in the Preparatory Commission which has existed in all its deliberations. These conversations eventually led to the abortive Anglo-French Accord which was announced by Sir Austen Chamberlain in the House of Commons, July 30, 1928.

CONFERENCES IN WHICH AMERICA WAS REPRESENTED

Conference	Place	Date
Sixth Pan-American Conference	Havana	Jan. 16-Feb. 20, 1928
League of Nations Preparatory Commission for the Disarmament Conference, Fifth Session	Geneva	March 15-24, 1928
Advisory Committee on Traffic in Opium, Eleventh Session	Geneva	April 12-27, 1928
League Health Committee, Twelfth Session	Geneva	April 30-May 5, 1928
International Copyright Union (Official Observer)	Rome	June 1-3, 1928
Permanent Committee of International Association of Road Congresses	Chantilly, France	June 30-July 1, 1928
Second Conference for the Abolition of Import and Export Prohibitions and Restrictions	Geneva	July 3-11, 1928
League of Nations Special Commission for the Preparation of a Draft Convention on the Private Manufacture of Arms and Ammunition and of Implements of War	Geneva	Aug. 30, 1928 Dec. 5, 1928
Meeting of Government Experts on Double Taxation and Tax Evasion	Geneva	Oct. 22-31, 1928
League Health Committee, Thirteenth Session	Geneva	Oct. 31, 1928
International Conference on Economic Statistics	Geneva	Nov. 26, 1928
Pan-American Arbitration Conference	Washington	Dec. 10, 1928
International Civil Aeronautics Conference	Washington	Dec. 11, 1928

CONFERENCES IN WHICH AMERICANS PARTICIPATED

Conference	Place	Date
League of Nations Financial Committee	Geneva	Feb. 27, 1928
Meeting to study the Coordination of International University Studies	Berlin	March 22-24, 1928
Information and Statistical Services of Banks of Issue	Paris	April 11-17, 1928
International Congress of Authors and Composers	Berlin	April 17, 1928
Meeting of Directors of National University Offices	Paris	April 17-18, 1928
Economic Consultative Commission	Geneva	May 14-19, 1928
Committee of Experts for the Progressive Codification of International Law	Geneva	June 22-28, 1928
League of Nations Economic Committee, Twenty-fifth Session	Geneva	June 25-28, 1928
League of Nations Malaria Commission, Fourteenth Session	Geneva	June 25-29, 1928
Committee of Experts on Infant Welfare	London	July 3, 1928

AMERICA'S RELATIONS TO THE LEAGUE OF NATIONS AND THE WORLD COURT

By Arthur Sweetser

Secretariat of the League of Nations at Geneva

GENERAL REVIEW

The relations of the United States to the League of Nations and the World Court continued during 1928 the favorable evolution which set in with the waning of the passions of

the 1920 Treaty fight. As regards the League, several reasons contributed: politically, it ceased to be an issue in the Presidential campaign; structurally, a better knowledge of its nature and scope developed from the Kellogg Pact discussions; diplomatically, the Bolivia-Paraguay incident established far-reaching precedents as the first threat of war in Latin-America and the first League suggestion for the political coöperation of the United States; finally, in the League's daily work, the consolidation, extension, and increased friendliness of American coöperation continued. As regards the World Court, the other nations elected Mr. Hughes as a judge to succeed Mr. Moore, appointed Mr. Root to the Committee to revise the statute, and put under study the advisory opinion question; while President Coolidge on his side announced his intention to resume negotiations forthwith for American membership.

THE PRESIDENTIAL CAMPAIGN

If the bitterness of 1920 and even the profound divisions of 1924 be recalled, it is little less than startling that, as if by mutual consent, the League figured not at all in the 1928 campaign. In the immediate aftermath of the Treaty conflicts and President Wilson's dramatic campaign and breakdown, the Democratic platform made the League its foundation piece, and the Republican its center of attack; Governor Cox accepted the banner of Mr. Wilson; Mr. Harding seemed to become more and more irreconcilable. By 1924, however, a decided drift had set in. The Republican platform accepted coöperation; the Democratic platform was far cooler than four years before; Mr. Coolidge, who even in 1920 had been pro-League, was guarded but more sympathetic than Harding; the Democratic candidate, Mr. Davis, was forced by circumstances largely to other issues.

This realignment was accentuated in 1928. The Republicans, under the circumstances, could not be too categorical in opposition. Accordingly, the familiar phraseology reappeared: "This government has definitely refused membership in the League of Nations. On this we stand. In accordance, however, with the long established American practice of giving aid and assistance to other peoples, we have most usefully assisted by cooperation in the humanitarian and technical work undertaken by the League without involving, etc." Very shortly, however, Mr. Hoover, in his acceptance speech, softened the mandatory tone and enlarged the practical scope of this pronouncement in saying: "Our country has refused membership in the League of Nations but we are glad to coöperate with the League in its endeavors to further scientific, economic, and social welfare, and to secure limitation of armaments,"—a big field indeed embracing a large part of the League's actual activities.

Meanwhile, a revolution was occurring in the Democratic party. A group very different from that which had supported Mr. Wilson directed the Houston Convention, and, for reasons partly of political expediency and partly to take the League out of politics, secured a party platform which omitted even the name. Similarly, Governor Smith, in his acceptance and campaign speeches, though understood to favor attendance "at any meeting where 55 nations come together," avoided specific reference.

The 1928 campaign, therefore, saw the disappearance of the issue which had been in the forefront in 1924 and at the very heart of the campaign in 1920. The upheaval, even reversal, caused in American political alignment by the war and especially its aftermath was passing. The Democrats were returning to their more traditional attitude. The Republicans began to return to the policy which had led to America's most active foreign development, as shown in the expansion of foreign trade, the Spanish war and first overseas possessions, and leadership in the Hague Peace Conferences. Indeed, the developments of the campaign seemed but part of the swing of a very long pendulum, which, with Mr. Hoover's original League views, his profound

belief in the conference system, his announced intention of accentuating foreign policy, and his record of sending delegates to every useful League conference, bade fair, as the year closed, to go even higher.

THE KELLOGG PACT

Coincident with this political change developed a better understanding of the League through the discussions surrounding the Pact for the Renunciation of War, which precipitated the general question of international organization and America's relationship thereto, with the League coming into debate at every turn. Enemies of the Pact often opposed it as leading to the League; League friends sometimes opposed it because it did not. This led to a close study of the points of difference and likeness between the two documents. When the American government proposed the Pact, it found an unexpected vigilance amongst the other countries to make no commitment which would weaken or nullify the Covenant. "The American government," said the French note of Jan. 21, "cannot be unaware of the fact that the great majority of the powers of the world, and among them most of the principal powers, are making the organization and strengthening of peace the object of common efforts carried on within the framework of the League of Nations." They have "duties which they cannot contravene"; there exists, therefore, "a condition of affairs which the United States, while a stranger thereto, cannot decline to take into consideration."

Thereupon followed an international debate largely on the nature and obligations of the Covenant. Secretary Kellogg, in stressing the value of "an unequivocal and unqualified renunciation of war as an instrument of national policy," put the question: "It is not entirely reasonable to conclude that a formal engagement of this character entered into by all the principal powers, and, ultimately, I trust, by the entire family of nations, would be a most effective instrument for promoting the great ideal of world peace which the League itself has so closely at heart?"

At this critical point, the question came indirectly to the very edge of League discussions. Up to the time of the March Council meeting, the European attitude to the Pact, particularly in political circles, was a combination of ignorance as to its nature, skepticism as to its value, and profound doubt as to what the American Government was aiming at. However, the gathering at Geneva of the leading statesmen, the opportunity of exchanging views from different angles, and the possibility of bringing out significances not previously understood, undoubtedly changed the general reaction towards both the purpose and the importance of the agreement.

Shortly after, on March 30, France, in view of certain interpretations given by the United States, agreed to approach the other governments at once. Her draft was different from the American, especially as to the League, and there developed the curious situation of the American Secretary of State giving members of the League an explanation of what he thought were their obligations under the Covenant. His declaration is of poignant memory in view of the charges in the 1920 Treaty fight and of vital importance in America's future consideration of the League. "The Covenant," he said, "imposes no affirmative primary obligation to go to war. The obligation, if any, is secondary and attaches only when deliberately accepted by a state. Article 10 of the Covenant has, for example, been interpreted by a resolution submitted to the Fourth Assembly but not formally adopted owing to one adverse vote to mean that 'it is for the constitutional authorities of each member to decide in reference to the obligation of preserving the independence and the integrity of members, in what degree the member is bound to assure the execution of this obligation by employment of its military forces.' There is, in my opinion, no necessary inconsistency between the Covenant and the idea of an unqualified renunciation of war. The Cove-

nant can, it is true, be construed as authorizing war in certain circumstances but it is an authorization and not a positive requirement."

These explanations, together with additions to the Preamble of the Pact, greatly clarified the situation. On July 14 France, repeating the interpretation that "none of the provisions of the new treaty is in opposition to the provisions of the Covenant," formally accepted the American proposals. Thirteen other nations promptly followed, most of them with special reference to the League, and the Treaty was signed Aug. 27. M. Briand, in his speech, said: "The League of Nations, a vast political undertaking of insurance against war and a powerful institution of organized peace where there is room to welcome all fresh contributions to the common work, cannot but rejoice at the signing of a international contract whereby it is to benefit. Far from being inconsistent with any of its obligations, this new act on the contrary offers it a kind of general reinsurance." Thereupon the Pact was sent to the Senate and was ratified Jan. 15, 1929.

THE MONROE DOCTRINE

On July 19, Costa Rica, in reply to the Council's invitation to resume membership in the League, asked the Council first to "define the scope given to the Monroe Doctrine when it was included in Article 21 of the Covenant." She expressed the fear that "for all the nations signatory" of the Covenant, "the international legal scope" of the Doctrine had been extended by this reference "into a constituent part of American public law." This was not an easy question to answer, for on the one hand the Council obviously could not interpret a policy of a single government and on the other there were reasonable doubts throughout the whole of Latin-America as to the significance of the reference. After full deliberation the Council replied on Sept. 1, not interpreting the Doctrine itself, but analyzing its relations to the Covenant. The Council recalled that "the validity of such international engagements as secure the maintenance of peace would not be affected by accession to the Covenant"; pointed out that Article 21 "neither weakens nor limits any of the safeguards provided in the Covenant"; and stressed that the Articles of the Covenant "confer upon all members of the League equal obligations and equal rights, in order, as the Preamble says, to promote international coöperation and to achieve international peace and security." Apparently this reply was satisfactory in both North and South America.

BOLIVIA-PARAGUAY

Little did the Council suspect, when it expressed this opinion in September, that it would be called upon to interpret it in practice in December. Dramatically enough, however, on the very day the Council was convening at Lugano for its 53rd session and the Pan-American Arbitration Conference was meeting in Washington, a sharp clash on the Bolivia-Paraguay frontier rapidly developed into a threat of war. Immediately, without waiting for official news or formal appeal, the Council sent a cable to both states recalling their obligations under the Covenant and urging mediation by whatever method seemed best. Shortly both states replied, admitting their obligations but without agreement on the method of fulfilling them. These messages the Council interchanged between the two states and, on receipt of still other replies, issued a firmer and more authoritative warning, if the states wished to respect their solemn obligations, of the need for mediation and of the extreme danger of the military movements mentioned by both governments. This whole correspondence was sent at once to all governments of the world, including the United States.

The following week, after the adjournment of the Council, when Bolivia had accepted the principle of mediation and Paraguay the offer of the Pan-American Conference, M. Briand, President of the Council, who had been given full powers, handed an *aide memoire* to the Chargé d'Affaires of the United States, whose government

was presiding over the Pan-American Conference. He explained that, if mediation were not shortly accepted, he would have to convoke an extraordinary session of the Council to consider what measures should be taken because war had broken out or was about to break out between two members of the League and concluded that "it would be of the greatest importance for the maintenance of peace —the supreme object which all must have in view—that the United States Government should inform him what measures could, in its opinion, be the most advantageously taken by all who are working to bring about a pacific settlement of the dispute." Though Bolivia's acceptance of Pan-American mediation happily resolved the immediate crisis, a precedent of far-reaching importance was undoubtedly established both for League action in Latin-America in the interests of peace and for requesting the coöperation of the United States in an international crisis. So far as known, Washington not only took no exception to the Council's actions but found them natural and helpful.

THE WORLD COURT

The question of American adherence to the Permanent Court of International Justice, which President Coolidge had unexpectedly described in an Armistice Day Speech in Kansas City in 1926 as a "closed incident" following the meeting of signatory states to consider the American reservations, was revived during 1928. On Feb. 6, Senator Gillett, with, it is understood, the President's approval, introduced into the Senate a resolution urging the Chief Executive to follow up the suggestion of further negotiations made in the detailed replies of the signatory states. While this resolution lay dormant for months in the Senate Foreign Affairs Committee and was finally scheduled to come up immediately on the reopening in December, President Coolidge unexpectedly announced at a breakfast Nov. 24 to 15 Republican Senators, that he intended to pursue such a course forthwith.

This news came closely on the heels of several important developments at Geneva. First, Charles Evans Hughes was elected by the Assembly and the Council to fill the unexpired term of John Bassett Moore, thus preserving the tradition of a judge of American nationality on this world bench. Second, on the proposal of the French delegation, the Assembly approved the creation of a Committee of Jurists to consider, before the reëlection of the whole bench in 1930, what amendments, if any, have been shown to be desirable in the Court Statute. Third, on the proposal of the Swiss Delegation, the Assembly also asked the Council to study, "when circumstances permit" whether unanimity or mere majority is required in the Assembly and the Council to ask the Court for an advisory opinion. At its December session, the Council decided to adjourn the advisory opinion matter, but duly created the Committee on the Court Statute, inviting, as one of the members, Elihu Root, who had taken a vital part in the drafting of the original Statute and who promptly accepted. Thus, during the year the United States decided to renew negotiations for membership in the Court; the two foremost American jurists were brought into formal coöperation with it, and the vexed question of advisory opinions was put on the table for study.

OTHER COÖPERATIVE STEPS WITH THE LEAGUE

Economics and Finance.—Meanwhile, in the accepted fields of cooperation between the United States Governnent and the League, several tendencies which began to set in three or four years ago were notably accentuated during 1928. On the one hand contacts already established were strengthened and extended; on the other, the formalistic relationship surrounding these contacts became more friendly and natural. America's widest coöperation with the League took place in the economic and financial field. The United States was not only represented at all three general conferences called by the League but took a full, normal and important part in them. For the Second Confer-

ence on the Abolition of Import and Export Restrictions in July, the government sent a delegation headed by Hugh R. Wilson, Minister at Berne, with assistants from the State, Commerce and Treasury Departments, who duly signed the resultant convention. For the Conference on Double Taxation and Fiscal Evasion, the government sent a delegation headed by Prof. Thomas S. Adams of Yale, with assistants from the Commerce and Treasury Departments, and for the Conference on Economic Statistics, the United States was represented by a delegation headed by Dr. E. Dana Durand, chief of the Statistical Division of the Department of Commerce.

Similarly, American private citizens were appointed by the League to the three major permanent committees in this field, and, though serving as individuals and not as government representatives, were able to make important contributions towards strengthening coöperation between American interests, both official and private, and those of other countries. For the newly created Economic Consultative Committee, which grew out of the World Economic Conference where America had been strongly represented, and which aims to make a periodic assessment of world economic life and problems, 5 Americans were named: Alonzo Taylor of Stanford University and Allyn A. Young of Harvard as members; Asher Hobson of the International Institute of Agriculture and Professor Willets of the University of Pennsylvania on invitation of the President of the Committee, and Roland W. Boyden, representing the International Chamber of Commerce. For the original Economic Committee, which meets quarterly to discuss certain more specific questions such as most-favored-nation treatment, commercial relations, and tariffs, Lucius Eastman, chairman of the Merchants' Association of New York, took his place for the first time. For the Financial Committee, which has negotiated 8 loans totaling over $400,000,000 and in going into special questions such as the purchasing power of gold, Jeremiah Smith Jr. of Boston, former League High Commissioner in Hungary, served as active member. In addition, Charles B. Eddy of New Jersey continued as President of the Greek Refuge Settlement Commission; Royall Tyler of Quincy as League agent in Budapest; and Pierre Jay as trustee for the Austrian Reconstruction loan, while the Federal Reserve Board was represented at a meeting of Central Banks by the League in April.

Disarmament.—The next most active, but least fruitful, American cooperation with the League was in connection with disarmament. The Government not only sent a strong delegation to the Preparatory Commission, composed of Hugh Gibson, Ambassador to Belgium, and representatives of the State, War and Navy Departments, but indicated throughout that it considered itself a permanent participant in that work, anxious to coöperate in any helpful proposal for armaments reduction. Little progress was made during the year, however, partly because the political situation was not ripe, partly because of the division created by the Anglo-French Naval accord. Nevertheless, the Government announced in December that it would be represented by the same delegation at the next meeting of the Commission.

An invitation to participate in the Arbitration and Security Committee, which grew out of the Preparatory Commission as an effort to explore the political approach to disarmament, was refused by the Government. Washington evidently felt it could coöperate in technical disarmament but hesitated to commit itself to the wider field of disarmament through agreements for arbitration and security. Nevertheless, the results of that Committee, as comprised in the General Act passed by the last Assembly, constitute a valuable addition to the world's material on peaceful settlement of disputes.

Finally in this field, the Government assumed regular membership on the Special Commission on the Private Manufacture of Arms, sending Mr. Wilson to both meetings in Au-

gust and December, where some slight progress was made. The Government also duly forwarded America's official military, naval, and air statistics for inclusion in the League's *Armaments Yearbook*.

International Law.—The Government took part in the preparatory work for the First Codification Conference, and George W. Wickersham continued as a member of the jurists' committee.

Health. — Surgeon-General Cumming, head of the Public Health Service at Washington, served as Vice-President of the League committee; Professor Winslow of Yale and Dr. Alice Hamilton of Harvard served as technical advisers; other American specialists participated in committees on malaria, infant welfare, and syphilis; and the International Health Board continued its important grants totaling about $130,000 for the year.

Social Questions.—While Miss Grace Abbot, head of the Children's Bureau at Washington, again could not attend in person, the Government forwarded useful data on prostitution, illegitimate children, and censorship of films; Major Bascom Johnson served as assessor on the Child Welfare Committee; and the experts' report on traffic in women and children, largely directed and financed by Americans, was given final publication.

Opium.—The Government forwarded its annual report and statements of seizures; State Department representatives continued on the Advisory Committee as "observers" and Colonel Arthur Woods as assessor; the Government refused participation in the nomination of the new Central Board, strongly attacked the 1925 Convention which created it, and was duly answered by the Council; the Government agreed to the Council's request for the Committee on opium-smoking created by that Convention to visit the Philippines and the Council named an American, Herbert May, to the Central Board.

Intellectual Coöperation.—The Government forwarded data on the exchange of official publications; the American Council on Education made a second grant of $4,000 for a new edition of the handbooks on European educational opportunities; Dr. Stephen P. Duggan served on several committees; and Raymond B. Fosdick and William Warner Bishop were named to the special committee in connection with Mr. Rockefeller's $2,000,000 library gift.

THE INSTITUTE OF POLITICS

By Walter Wallace McLaren

Executive Secretary, Institute of Politics, Williamstown

INSTITUTE PROGRAM

Eighth Session.—The program of the Institute of Politics during its eighth session at Williamstown, Massachusetts, held in August, was in the main devoted to the study of clashes of a peaceful nature. Certain of its conferences dealt also with the political and legal problems which arise between advanced and backward nations in the course of their contact with each other,—Japan and China, the United States and Mexico, the United States and the Caribbean area. How far are backward nations entitled to claim the right of self-determination? By what means is the status of a backward nation to be determined. Is it by military force, or by the absence of a culture with elements which permit it to absorb and imitate the superior culture of the more advanced peoples? When does a backward nation cease to be backward? Such questions were taken up at great length.

Lectures.—The following courses of lectures were given: "Modern Turkey and Its Problems," by Halidé Edib Hanum, a remarkable woman produced by the "Party of Progress and Union"; gifted as a writer, as an

administrator, as a lecturer, who has had a thrilling career as a revolutionist, a reformer, and a feminist; "Current Political Problems in Belgium," by Dr. Louis Pierard of Brussels, a member of the Belgian Parliament and Editor of "Le Peuple" in Brussels; "Germany's Foreign and Domestic Policies" by Dr. Otto Hoetzsch of Berlin, Professor of History in the University of Berlin and a member of the Reichstag; "Means of Social Direction," by Graham Wallas of London, an author of many books in the field of Political Science and Psychology, Professor Emeritus, London University and a former member of the London County Council.

Addresses.—In addition, addresses were delivered on: "The Domestic and Foreign Program of the Kuomintang," by Dr. C. C. Wu, a former Foreign Minister of the Nationalist Government in China; "The Task of Educating China's Millions" by James Yen, Peking, the founder of the movement; "The Responsibilities for the World War; Personal Recollections," by Count Carlo Sforza, former Foreign Minister in the Italian Cabinet.

Round Table Conferences.—The following is a list of Round Table Conferences held: "Problems of the Pacific," by Professor George H. Blakeslee; "Protection of Citizens Abroad," by Professor Edwin M. Borchard; "Inter-American Economic and Commercial Relations," by Professor Harry T. Collings; "Agriculture and the Agricultural Surplus: An International Approach," by Professor C. F. Fay; "Recent Inter-American Relations and Problems," by Professor Charles W. Hackett; "Modern Turkey and Its Problems," by Halidé Edib Hanum; "Population Problems on the Pacific Rim," by Professor R. D. McKenzie; "Methods of Social Direction," by Professor Graham Wallas; "Problems of Africa," by Dr. Raymond Leslie Buell; "Problems of Peace in Europe," by Count Carlo Sforza.

ECONOMIC IMPERIALISM

The philosophy of Economic Imperialism, from the point of view of the advanced peoples, may be stated as follows: To cultivate sources of raw materials in the undeveloped areas of Asia, Africa and South America in order to keep the industrial and commercial machines running and the workers employed. The rights of the peoples inhabiting such penetrated regions are not inherent in the fact of their tribal or national cultures but in the principle of fair dealing between the two parties by which alone those who are gifted enough to adjust themselves to the new régime of industry or commerce may have a chance to enjoy the benefits of the new culture often too summarily forced upon them. Here as well as in the competition between advanced nations for sources of raw materials and markets for finished goods great problems of foreign relations, political and legal, have their origin. The people of the United States more than those of any other big power must give thought to questions of this kind and find the proper answers if our relations with the rest of the world are to remain amicable and equitable.

DOMESTIC PROBLEMS

In the same way many of our domestic problems,—the disposal of the agricultural surplus, the rights of property, the future of democracy,—must be solved if all sections of our own growing population are to enjoy their share of prosperity under institutions of free government. There must be not only the willingness, but the capacity in our people to look at these problems from a fresh point of view and with an eye to the realities of the situation if we are to succeed in "rationalizing" them. The expedient of legislation is not likely to suffice as a solution of the farm problem, nor is it any more likely to succeed in securing to the people of this country the perpetuation of democratic institutions or a more equitable distribution of wealth and income. These great gifts can only be continued to a people, all the sections of whom are willing to deal with each other according to principles of fair play and an equitable observance of the rights of others.

THE KELLOGG TREATIES

Pact of Paris. — The principal events connected with the formal cooperation of the American Government in world affairs in the year 1927-1928 were the signing of the Pact of Paris, renouncing war as an instrument of national policy, and the signing of a number of arbitration treaties of the Bryan type. The motive of the Administration in sponsoring the Pact of Paris was doubtless a desire to bring the Government's policy in international affairs into a closer alignment with public opinion. It remains to be seen whether the Senate will ratify the Pact to which Secretary Kellogg, on behalf of the Administration, has set his name.

Significance of Treaties.—The Kellogg Treaties are not only an indication of the revival in the United States of interest in world peace but an argument for the view that the general condition of Europe and the rest of the world is calmer than it has been for the past ten years. It is an acknowledgment by the people of the United States of the fact that the United States should, and can with safety to its many interests, state its position and take its place in support of that position against the recurrence of aggressive wars. As a people we have outgrown our fear of alliances and we have left behind the isolation of 1920 and are ready to adopt a policy of limited cooperation with the other powers in outlawing wars of aggression. Permanent progress of humanity, the people of this country believe, is to be made along lines of competitive business, in the development of resources, in the production of commodities, and in the improvement of the standards of living of the peoples of the world.

FUTURE QUESTIONS

Economic and Social. — These things being so, it is possible to look forward and examine questions that are likely to arise in connection with the economic and social advancement of the peoples who may be classed as great nations in their clash with so-called backward nations. The clash of national cultures is inevitable in this development, even though the means be peaceful, quite as much so as before the signing of the Pact of Paris. Economic penetration is a much more destructive engine when directed against the tribal culture of backward peoples than is aggressive warfare. The establishment of a plantation system in Liberia, Malaya, or Porto Rico, or in any other backward part of the earth, is much more likely to change the status of the inhabitants of such regions than is invasion with a division of highly trained troops.

Plans for 1929.—The Institute of Politics will hold its next session in August, 1929, and will organize its program for the purpose of continuing the study of pertinent problems in the field of international affairs. As an experiment in adult education and the creation of public opinion based upon an examination of the policies and problems of our own and other nations, the Institute has demonstrated its usefulness and has been designated "one of our national institutions."

INSTITUTE OF PACIFIC RELATIONS

By George G. Wilson

Professor, Harvard University

ORGANIZATION

First Session.—Several years ago Secretaries from some of the Young Men's Christian Associations in the countries about the Pacific Ocean realized the necessity of a conference upon the problems of that area. A short study convinced them that the problems should command the attention of many whose interests were not concerned with their organization. Accordingly, to consider what might

be done, there gathered in Honolulu, "the Cross Roads of the Pacific," in 1925 a small group, about 125 persons, representative of a cross-section of the countries of the Pacific area. This group included persons from Australia, Canada, China, Hawaii, Japan, Korea, New Zealand, the Philippines, and the United States.

Problems Discussed.—Inasmuch as no person represented any state or party and each spoke only for himself the ordinary restrictions imposed upon official utterances were not evident. The preparations for the meeting in 1925 were necessarily tentative and the purpose was to determine by a frank interchange of views what were the important problems of the Pacific which should receive consideration and what the prevailing attitude upon some of these problems was. Some in 1925 feared that such topics as the immigration question would be too delicate for discussion by a group from the countries bordering on the Pacific in which all shades of opinion might be found.

This question was thrown open for full discussion, and this discussion was frank and helpful to all because it was behind closed doors and each speaker felt free to express his opinion without fear that it would be spread abroad in sensational publicity. Such addresses as that on "The Policies of the United States as Others See Them" furnished topics for thought and study to those who came from the great Federal republic. Similarly frank opinions upon other countries and topics showed the need of much more intelligent understanding of the Pacific area and its problems. It was plain from the meeting of the Institute in 1925 that more detailed knowledge of conditions in the Pacific should be available if a subsequent meeting of the Institute was to be held and it was the unanimous opinion that another meeting should be held.

Second Session.—Committees were designated in each country whose duty it should be to name persons who could contribute to the success of the second session of the Institute. About 135 persons came together in 1927 from Australia, Canada, China, Great Britain, Japan, Korea, New Zealand, the Philippines, and the United States. The League of Nations also detailed three observers to attend the Institute sessions. The meetings of 1925 and 1927 held in the quiet halls of Punahou College, where the members lived and dined in a common hall with constantly changing table companions, often a half-dozen different nationalities, showed the possibility of a conference for understanding even of problems from which diplomacy may shrink.

Scope of Discussion.—In 1927 for two summer weeks the members of the Institute came together in Honolulu with a considerable mass of data upon problems which the different groups regarded as important. Facts were considered much more essential than opinions. Round table groups discussed population, immigration, race relations, intermarriage, political and cultural relations, religion, missions, food supply, communications, labor or any topic for which the program committee, made up of persons from all groups, could find time. As immigration was one of the foremost questions in 1925, the situation in China, extraterritoriality, "the Shanghai incident," etc., came to the fore in 1927.

Round Table Topics.—Though the Institute was launched quietly in 1925, at the opening in 1927 greetings came from various countries and a telegram from President Coolidge. The amount of printed data available for the members in 1927 was in striking contrast to that in 1925. Thousands of pages of material gave points of view and made possible advanced preparation of a substantial nature for the round tables. Here before a group of about twenty-five persons, a missionary might present his view and be followed by an able Buddhist, a labor leader might reply to a capitalist, a Chinese to a Japanese member and an Australian might present the case of a "White Australia." The changing standards of living, tariffs, the changing status of woman in the Pacific area, the superiority complex of certain races,

and many other matters were discussed with the utmost frankness and sometimes with warmth.

It was often discovered that preconceived ideas long current in certain countries had no bases in fact, and in the intimate face-to-face conversations on the wide piazzas in the tropical evenings men and women of different races, religions, and customs, came to understand the need of intelligent united effort to solve the problems of the Pacific, before these reached such a condition as had but a few years earlier brought disaster to Europe. The attempt was not merely to give attention to problems which had already arisen but to anticipate and avoid misunderstandings and also to initiate constructive policies which would make for the well-being of all.

AIM AND PURPOSE

The statement of purposes and organization called the Constitution, adopted in 1927, states the purpose to be "to study the conditions of the Pacific peoples with a view to the improvement of their mutual relations." The organization of the Institute of Pacific Relations is very simple, aiming to make each meeting so far as possible self-determining, though to economize time the program of the first two or three days may be arranged in advance. What is known as the Pacific Council has eight members from the different countries of the Pacific. At present this Council consists of F. W. Eggleston, Australia; Sir Robert Borden, Canada; David Z. T. Yui, China; Frank C. Atherton, Hawaii; Lionel Curtis, Great Britain; J. Inouye, Japan; Sir James Allen, New Zealand; President R. L. Wilbur, United States. Each country also has its national council and officers. There is a central secretariat at Honolulu. Most of the councils are carrying on special research and other undertakings preparatory to the next meeting which is scheduled to be in Japan in 1929.

As the meeting of 1927 closed, it was remarked that William H. Seward exactly seventy-five years before, on July 29, 1852, had raised one of the most important world questions when he said:

> "Who does not see, then, that every year hereafter, European commerce, European politics, European thoughts, and European activity, although actually gaining greater force—and European connections, although actually becoming more intimate—will, nevertheless, relatively sink in importance; while the Pacific Ocean, its shores, its islands, and the vast regions beyond, will become the chief theatre of events in the world's great hereafter?"

Reports.—The reports of the two sessions of the Institute of Pacific Relations are now published and available: *Institute of Pacific Relations*, June 30-July 14, 1925, Honolulu, 1925; and *Problems of The Pacific, Proceedings of the Second Conference of the Institute of Pacific Relations*, Honolulu, Hawaii, July 15 to 29, 1927. Chicago, 1927.

COGNATE SOCIETIES

GENERAL

ACADEMY OF POLITICAL SCIENCE IN THE CITY OF NEW YORK.—Fayerweather Hall, Columbia University, New York, N. Y.

AMERICAN PEACE AWARD.—565 Fifth Ave., New York, N. Y.

AMERICAN SOCIETY OF INTERNATIONAL LAW.—2 Jackson Place, N. W., Washington, D. C.

ARBITRATION SOCIETY OF AMERICA, INC.—342 Madison Ave., New York, N. Y.

CARNEGIE ENDOWMENT FOR INTERNATIONAL PEACE.—2 Jackson Place, N. W., Washington, D. C.

COUNCIL OF ARBITRATION.—342 Madison Ave., New York, N. Y.

EMERGENCY FOREIGN POLICY CONFERENCE.—1414 Monadnock Block, Chicago, Ill.

FOREIGN POLICY ASSOCIATION.—18 E 41st St., New York, N. Y.

INTERNATIONAL LAW FOUNDATION.—165 Broadway, New York, N. Y.

INTERNATIONAL REFORM FEDERATION.—206 Pennsylvania Ave. S. E., Washington, D. C.

League of Nations Non-partisan Association.—6 E. 39th St., New York, N. Y.

League of Nations Union.—70 Fifth Ave., New York, N. Y.

National Council for Prevention of War.—532 17th St., N. W., Washington, D. C.

National Council of Foreign Service Training.—U. S. Bureau of Education, Washington, D. C.

People's Reconstruction League.—35 B. St., N. W., Washington, D. C.

Women's International League for Peace and Freedom.—Bible House, New York, N. Y.

Women's Peace Society.—20 Vesey St., New York, N. Y.

Woman's Peace Union.—39 Pearl St., New York, N. Y.

World Peace Foundation.—40 Mt. Vernon St., Boston, Mass.

REGIONAL

Armenia-America Society. — 289 Fourth Ave., New York, N. Y.

American Committee for Armenian Independence.—1 Madison Ave., New York, N. Y.

American Asiatic Association.—21 State St., New York, N. Y.

China Society of America.—19 E. 44th St., New York, N. Y.

Committee on Coöperation in Latin America.—419 Fourth Ave., New York, N. Y.

English-Speaking Union of the U. S.—19 West 44th St., New York, N. Y.

Far East Conference.—17 Battery Place, New York, N. Y.

French Institute of the United States.—22 E. 60th St., New York, N. Y.

Friends of Belgium.—32 Broadway, New York, N. Y.

Friends of Freedom for India.—799 Broadway, New York, N. Y.

Friends of Irish Freedom.—280 Broadway, New York, N. Y.

Japan Society, Inc.—36 W. 44th St., New York, N. Y.

National Association for Protection of American Rights in Mexico.—17 Battery Place, New York, N. Y.

Pan-American Society of the United States, Inc.—89 Broad St., New York, N. Y.

Pan-Pacific Union.—Honolulu, Territory of Hawaii.

Persia Society.—110 E. 42nd St., New York, N. Y.

Society of the Friends of Roumania, Inc.—36 W. 44th St., New York, N. Y.

PART TWO
AMERICAN GOVERNMENT

DIVISION III
THE NATIONAL GOVERNMENT

PERSONNEL ANALYSIS OF THE SEVENTIETH CONGRESS

By Milton Conover

Professor, Yale University

PARTY ALIGNMENT

Senate.—At the opening of the First Session of the Seventieth Congress on December 5, 1927, the Senate was composed of 48 Republicans, 47 Democrats and one Farmer-Laborite. At the opening of the Second Session on December 3, 1928, however, this alignment was altered so as to give the Republicans the advantage of 49 Senators, and the Democrats 46, along with the one Farmer-Laborite. This was a slight gain for the Democrats as compared with their strength (The American Year Book, 1926, p. 122) when the alignment was 56 Republicans, 39 Democrats and one Farmer-Laborite.

House.—The First Session of the Seventieth Congress found the House of Representatives with 237 Republicans, 195 Democrats, 2 Farmer-Laborites, and one Socialist; while the Second Session began with 235 Republicans, 193 Democrats, the same number of minor party representatives and 4 vacancies, as compared with the 1926 alignment of 247 Republicans, 183 Democrats, 3 Farmer-Laborites, and 2 Socialists.

NATIVE AND ADOPTED SONS

Senate.—In 1928, there were 46 Senators who were born outside of the states from which they were elected, 32 of whom represented states that elected non-natives only. These states represented the several sections of the United States. They were: New Hampshire, the only New England State in this category; New York, of the Middle Atlantic group; Tennessee and Florida of the South; Michigan, North Dakota and Missouri of the Middle West; Colorado, Wyoming, Montana, and Idaho of the Rocky Mountain area; Nevada and Washington of the Pacific Slope; and New Mexico and Oklahoma of the Southwest.

Fourteen states sent to the Congress one Senator who was a native of his state, and one other who was a non-native, thus: Connecticut, Rhode Island and Maine; New Jersey, Delaware, and Maryland; Kentucky and Arkansas; Indiana, Iowa, Minnesota, and South Dakota; California; and Arizona.

Three of the Senators were born outside of the United States: Senator Bingham of Connecticut was born of American parentage in Hawaii; Senator Couzens of Michigan is a native of Canada; and the late Senator Gooding of Idaho was born in England.

From eighteen states, both Senators were native-born citizens of those states; namely, Massachusetts and Vermont; Pennsylvania; the Southern contiguous group,—Virginia,

West Virginia, North Carolina, South Carolina, Georgia, Alabama, Mississippi, Louisiana and Texas; the Middle Western States—Ohio, Illinois, Kansas and Wisconsin; Utah and Oregon. This situation compares favorably with that of 1926 (THE AMERICAN YEAR BOOK, 1926, pp. 122-123).

House.—In the House of Representatives, the number of non-natives seems to have been reduced from that of 1926 by just about one member, there being 136 migrants who achieved election to Congress from states of their choice rather than from states of their birth. Seven commonwealths sent to the House migrants only. These were all Western states: New Mexico, Colorado, Wyoming, South Dakota, Idaho, Nevada, Washington. Incidentally, all but one of Oklahoma's eight representatives were migrants from other sections of the country.

Eight states elected native sons only to represent them in the House, —Maine, Vermont, Delaware, Virginia, Georgia, Mississippi, Arizona, and Oregon.

Sixteen foreigners, being natives respectively of ten different nations, represented nine different states in the House in the 7th Congress. Eleven of these were natives of the British Empire, including six Canadians and three Englishmen. Of this foreign-born group in the House, Illinois elected four who were natives respectively of England, Canada, Norway and Czechoslovakia. Ohio sent three: an Englishman, a Canadian, and a Scotchman. New York elected an Englishman, an Irishman, and a Russian. Rhode Island, West Virginia, and North Dakota each sent a native Canadian, while New Jersey elected a Nova Scotian. Maryland sent an Italian and Wisconsin elected a native of Austria-Hungary.

AGE AND EXPERIENCE

Senators.—The ages of senators in 1928 ranged from that of Robert M. LaFollette of Wisconsin, who was born in 1895, to that of Francis E. Warren of Wyoming, born in 1844. Senator Warren also led his colleagues in point of continuous service, having served since 1895 when LaFollette first saw the light. Furthermore, he had served in the Senate from 1890 until 1893 before beginning his longer career. There were 72 senators who were born prior to 1876. Of these, fifteen appeared before the Civil War. They were McLean of Connecticut, Gillette of Massachusetts, Gould of Maine, Metcalf of Rhode Island, Curtis of Kansas, Bruce of Maryland, Ferris of Michigan, Walsh of Montana, Warren and Kendrick of Wyoming, Glass of Virginia, Fletcher of Florida, Ransdell of Louisiana, Simmons and Overman of North Carolina. Twenty senators were born during the Civil War years, while thirty-seven others were born in the Reconstruction Era (1866-1876). Fifteen senators were under fifty years of age at the opening of the first session; namely, Reed of Pennsylvania, Tydings of Maryland, Harrison of Mississippi, Black of Alabama, Mayfield of Texas, Robinson of Indiana, Steck of Iowa, LaFollette of Wisconsin, Nye of North Dakota, Shipstead of Minnesota, Wheeler of Montana, Steiwer of Oregon, Dill of Washington, Bratton and Cutting of New Mexico.

Representatives.—The ages of representatives ranged from that of Melvin J. Maas of Minnesota, born in 1898, to that of Charles M. Stedman of North Carolina who was born in 1841. Three other members were within ten years of Mr. Stedman's age: Dickinson of Missouri, Graham of Pennsylvania, and Burton of Ohio who had been a senator previously. There were 267 representatives above the age of fifty. Of these, 41 were born prior to the Civil War, 45 during that conflict, and 181 during the Reconstruction Decade (1866-1876). It appears, moreover, that in the 70th Congress, 61 per cent of the House and 75 per cent of the Senate had passed the half-century mark as compared with the 69th Congress, of whose personnel 59 per cent of the House and 77 per cent of the Senate were beyond 50 years of age. Of the Representatives who held the records for the longest periods of service in

the House, Cooper of Wisconsin had been a member for seventeen terms; Haugen of Iowa, fifteen terms; Pou of North Carolina, fourteen terms; and Garver of Texas, thirteen terms.

THE EDUCATIONAL STANDARD

Senate.—The academic standard of the 70th Congress was raised slightly above that of the previous Congress. Of the 96 senators, 72 or 75 per cent had attended colleges or universities as compared with 71 or 73 per cent of the 69th Congress. Of these, 38 held academic, non-professional bachelor's degrees; 21, the master's rank; while one had the Ph.D. The professional LL.B. had been won by 27 senators. Also, 23 senators had been granted honorary titles. Among these 72 actual collegians, 54 different institutions were represented, Harvard and Michigan leading with five and four sons respectively.

House.—A more striking gain in academic prestige was realized in the House of Representatives than in the Senate. Here, the members who had been trained in standard institutions of collegiate rank numbered 308 or 78 per cent of that body as compared with only 69 per cent of the House membership of the 69th Congress. This trend, however, has been almost continuous during the past half-century. Of these 308 college-bred congressmen, 152 held the academic or non-professional bachelor's degree, including 115 who had won the A.B.; 34 held the M.A.; four had achieved the Ph.D. degree. There were 145 who had taken the professional LL.B., while 22 had been honored with the doctorate of laws,—almost the same number as in the Senate. Of the 308 members who had been college students, 137 had attended state colleges or universities, 14 of whom had studied at the University of Michigan; 19 at Harvard; 14 at Yale; and three at Princeton.

PROFESSIONS AND CALLINGS

Vocational.—The vocational aspect of the 70th Congress deviated very little from that of the 69th Congress as heretofore reported. In both Houses, the best represented professions continued to be the law, business, education, journalism, and farming. In the Senate there were 62 lawyers, 18 business men, 7 journalists, 3 educators and three farmers with a senator representing each of the professions of medicine, dentistry, and engineering. These 62 lawyers assembled from 43 states, the 18 business men from 15 states.

There were 255 lawyers in the House of Representatives, along with 62 business men, 23 educators, 21 journalists, 13 farmers, and smaller representations of engineering, medicine, the ministry, and labor. The lawyers were returned from 46 of the states, and the business men from 20 states.

Authors.—Three of the Senators had acquired recognition as standard authors before entering the 7th Congress:—Hiram Bingham of Connecticut; William C. Bruce of Maryland, and Simeon D. Fess of Ohio. Each had written more than one book.

The House of Representatives was even better endowed with authors of similar recognition: Charles F. Curry of California, Cyrenus Cole of Iowa, Charles E. Winter of Wyoming, James M. Beck and Henry W. Temple of Pennsylvania, Andrew J. Montague and Henry S. Tucker of Virginia, and the Massachusetts trio, Fred W. Dallinger, James A. Gallivan, and Robert Luce; the leading works of the latter treat of the science of legislation.

WAR SERVICE

Senate.—The military experience contributed to the 70th Congress was almost the same as in the preceding Congress. There were 16 service veterans in the Senate, including Francis E. Warren who served as a private during the Civil War. Four others served during the Spanish War and eleven had enlisted for the World War. Brookhart of Iowa has a service record for the Spanish War, the Mexican Border Affair, and the World War.

House.—The 70th Congress enrolled 66 military veterans, 42 of whom had served during the World War and 13 during the Spanish conflict. Congressman Stedman, who served in the Confederate Army in

1865, was the sole representative in the House of that struggle, just as Francis E. Warren was the sole representative in the Senate of the same war.

PUBLIC SERVICE

Senate.—All but six of the senators of the 70th Congress had had some form of experience in politics or in governmental service. The six novices were: Nye of North Dakota, Steck of Iowa, Pine of Oklahoma, Phipps and Waterman of Colorado, and LaFollette of Wisconsin who had been secretary to his father. Virtually the governmental units in the Federal system had served as training schools for some of the 90 senators with public service records. County governments had given experience to 17 senators, city offices to 21, the state legislatures had helped to train 42, and other state positions had afforded apprenticeship to 55 of whom 23 had been governors of commonwealths. More than half of the senators had served in the Upper House during preceding congresses.

House.—Apparently, the House of Representatives is becoming less and less an amateur body of statesmen. Yet four representatives in the 70th Congress acknowledge in their biographies that they never before have held public office. As in the Senate, however, most of the others have had rich experience in either state or local politics, and 386 of them had had previous memberships in the House. There were 135 representatives who had served in county positions; more than a score had been members of city legislatures, and 167 had served in state legislatures, and of these there were 38 who had been members of both houses of their respective legislatures.

RELIGIOUS AFFILIATIONS

Senate.—In the Congressional Directory biographies of nearly half of the senators, church membership is acknowledged. There are 13 Episcopalians, 12 Methodists, 4 Baptists, 4 Presbyterians and a few each of Congregationalists, Unitarians, Catholics, Lutherans and Latter Day Saints.

House.—In the House, there were 260 professing religious faiths, including 53 Methodists and 15 Southern Methodists, 45 Presbyterians, 39 Episcopalians and an equal number of Baptists, 17 Catholics, 15 Congregationalists, 10 Lutherans and a fewer representation of Hebrews, Friends, Unitarians, Church of Christ, Disciples of Christ, Reformed, and of Latter Day Saints.

FRATERNITY AND LODGE AFFILIATIONS

Senate.—The unofficial fellowship interests of the senators may be suggested by the fact that the Senate includes 85 memberships in fraternities and orders. Of these, 28 are of the Masonic order, 13 of the Elks, 6 of the Odd Fellows, and 5 of the Knights of Pythias. Other lodges which have fewer brothers in the Senate are the Woodmen, Red Men, Moose, Eagles, Maccabees, and the Grange. Three senators are Rotarians.

House.—The fraternity memberships in the House of Representatives of the 70th Congress were of proportions similar to those of the Senate. They included 202 Masons, of which 66 were of the Mystic Shrine, 51 of the Knights Templars and 50 were of the 32nd degree Masons. Also, there were 104 Elks, 67 Knights of Pythias, 62 Odd Fellows, 36 Woodmen, 20 Moose, 15 each of Red Men and Eagles, 7 Knights of Columbus, 6 Grangers, and fewer memberships in twenty other organizations of similar character. Furthermore, 15 representatives were Rotarians, 9 were members of Kiwanis, and 6 were Lions.

MEMBERS OF THE SENATE

Compiled from the Congressional Directory, Year 1928

Dates show beginning of service in the Senate. Names of Republicans are in Roman type; those of Democrats in *Italic;* Farmer-Labor in ROMAN CAPS.

ALABAMA
J. Thomas Heflin (1920).
Hugo L. Black (1926).

ARIZONA
Henry F. Ashurst (1912).
Carl Hayden (1927).

ARKANSAS
Joseph T. Robinson (1913).
T. H. Caraway (1921).

CALIFORNIA
Hiram W. Johnson (1917).
Samuel M. Shortridge (1921).

COLORADO
Lawrence C. Phipps (1919).
Charles W. Waterman (1926).

CONNECTICUT
George P. McLean (1911).
Hiram Bingham (1924).

DELAWARE
Thomas F. Bayard (1922).
Coleman du Pont (1925).

FLORIDA
Duncan U. Fletcher (1909).
Park Trammell (1917).

GEORGIA
William J. Harris (1919).
Walter F. George (1922).

IDAHO
William E. Borah (1907).
John Thomas (1928).

ILLINOIS
Charles S. Deneen (1925).
Otis F. Glenn (1928).

INDIANA
James E. Watson (1916).
Arthur R. Robinson (1925).

IOWA
Smith W. Brookhart (1922).
Daniel F. Steck (1924).

KANSAS
Charles Curtis (1915).
Arthur Capper (1919).

KENTUCKY
Frederic M. Sackett (1925).
Alben W. Barkley (1927).

LOUISIANA
Joseph E. Ransdell (1913).
Edwin S. Broussard (1921).

MAINE
Frederick Hale (1917).
Arthur R. Gould (1926).

MARYLAND
William Cabell Bruce (1923).
Millard E. Tydings (1923).

MASSACHUSETTS
Frederick H. Gillett (1925).
David I. Walsh (1926).

MICHIGAN
James Couzens (1922).
Arthur H. Vandenberg (1928).

MINNESOTA
HENRIK SHIPSTEAD (1923).
Thomas D. Schall (1925).

MISSISSIPPI
Pat Harrison (1919).
Hubert D. Stephens (1923).

MISSOURI
James A. Reed (1911).
Harry B. Hawes (1926).

MONTANA
Thomas J. Walsh (1913).
Burton K. Wheeler (1923).

NEBRASKA
George W. Norris (1913).
Robert B. Howell (1923).

NEVADA
Key Pittman (1913).
Tasker L. Oddie (1921).

NEW HAMPSHIRE
George H. Moses (1918).
Henry W. Keyes (1919).

NEW JERSEY
Walter E. Edge (1919).
Edward I. Edwards (1923).

NEW MEXICO
Sam G. Bratton (1925).
Octaviano A. Larrazolo (1928).

NEW YORK
Royal S. Copeland (1923).
Robert F. Wagner (1926).

NORTH CAROLINA
Furnifold M. Simmons (1901).
Lee S. Overman (1903).

NORTH DAKOTA
Lynn F. Frazier (1923).
Gerald P. Nye (1925).

OHIO
Simeon D. Fess (1923).
Cyrus Locher (1928).

OKLAHOMA
W. B. Pine (1925).
Elmer Thomas (1927).

OREGON
Charles L. McNary (1918).
Frederick Steiwer (1926).

PENNSYLVANIA
David A. Reed (1922).
William S. Vare (1928).

RHODE ISLAND
Peter G. Gerry (1917).
Jesse H. Metcalf (1924).

SOUTH CAROLINA
Ellison D. Smith (1909).
Coleman L. Blease (1925).

SOUTH DAKOTA
Peter Norbeck (1921).
W. H. McMaster (1925).

TENNESSEE
Kenneth McKellar (1917).
Lawrence D. Tyson (1925).

TEXAS
Morris Sheppard (1913).
Earle B. Mayfield (1923).

UTAH
Reed Smoot (1903).
William H. King (1917).

VERMONT
Frank L. Greene (1923).
Porter H. Dale (1923).

VIRGINIA
Claude A. Swanson (1910).
Carter Glass (1920).

WASHINGTON
Wesley L. Jones (1909).
C. C. Dill (1923).

WEST VIRGINIA
M. M. Neely (1923).
Guy D. Goff (1925).

WISCONSIN
Robert M. La Follette, Jr. (1925).
John J. Blaine (1926).

WYOMING
Francis E. Warren (1895).
John B. Kendrick (1917).

MEMBERS OF THE HOUSE OF REPRESENTATIVES

Compiled from the Congressional Directory, Year 1928

Republicans in Roman; Democrats in *Italics;* Farmer-Labor in ROMAN CAPS; Socialist in *ITALIC CAPS.*
Dates show the beginning of service in the House.

ALABAMA

1. *John McDuffie* (1919).
2. *Lister Hill* (1923).
3. *Henry B. Steagall* (1915).
4. *Lamar Jeffers* (1921).
5. *La Fayette L. Patterson* (1928).
6. *William B. Oliver* (1915).
7. *Miles C. Allgood* (1923).
8. *Edward B. Almon* (1915).
9. *George Huddleston* (1915).
10. *William B. Bankhead* (1917).

ARIZONA

At large—*Lewis W. Douglas* (1927).

ARKANSAS

1. *William J. Driver* (1921).
2. (Vacant).
3. *John N. Tillman* (1915).
4. *Otis Wingo* (1913).
5. *Heartsill Ragon* (1923).
6. *James B. Reed* (1923).
7. *Tilman B. Parks* (1921).

CALIFORNIA

1. *Clarence F. Lea* (1917).
2. Harry L. Englebright (1926).
3. Charles F. Curry (1913).
4. Florence P. Kahn (1925).
5. Richard J. Welch (1925).
6. Albert E. Carter (1925).
7. Henry E. Barbour (1919).
8. Arthur M. Free (1921).
9. W. E. Evans (1926).
10. Joe Crail (1927).
11. Philip D. Swing (1921).

COLORADO

1. *S. Harrison White* (1927).
2. Charles B. Timberlake (1915).
3. Guy U. Hardy (1919).
4. *Edward T. Taylor* (1909).

CONNECTICUT

1. E. Hart Fenn (1921).
2. Richard P. Freeman (1915).
3. John Q. Tilson (1915).
4. Schuyler Merritt (1917).
5. James P. Glynn (1925).

DELAWARE

At large—Robert G. Houston (1925).

FLORIDA

1. *Herbert J. Drane* (1917).
2. *R. A. Green* (1925).
3. *Thomas A. Yon* (1927).
4. *William J. Sears* (1915).

GEORGIA

1. *Charles G. Edwards* (1925).
2. *E. E. Cox* (1925).
3. *Charles R. Crisp* (1913).
4. *William C. Wright* (1918).
5. *Leslie J. Steele* (1927).
6. *Samuel Rutherford* (1925).
7. *Malcolm C. Tarver* (1927).
8. *Charles H. Brand* (1917).
9. *Thomas M. Bell* (1905).
10. *Carl Vinson* (1914).
11. *William C. Lankford* (1919).
12. *William W. Larsen* (1917).

IDAHO

1. Burton L. French (1917).
2. Addison T. Smith (1913).

ILLINOIS

At large—Richard Yates (1919).
(Vacant).
1. (Vacant).
2. Morton D. Hull (1923).
3. Elliott W. Sproul (1921).
4. *Thomas A. Doyle* (1923).
5. *Adolph J. Sabath* (1907).
6. *James T. Igoe* (1926).
7. M. Alfred Michaelson (1921).
8. *Stanley H. Kunz* (1921).
9. Fred A. Britten (1913).
10. Carl R. Chindblom (1919).
11. Frank R. Reid (1923).
12. John T. Buckbee (1926).
13. William R. Johnson (1925).
14. John C. Allen (1925).
15. Edward J. King (1915).
16. William E. Hull (1923).
17. Homer W. Hall (1927).
18. William P. Holaday (1923).
19. Charles Adkins (1925).
20. *Henry T. Rainey* (1923).
21. *J. Earl Major* (1926).
22. Ed. M. Irwin (1925).
23. *William W. Arnold* (1923).
24. Thomas S. Williams (1915).
25. Edward E. Denison (1915).

INDIANA

1. Harry E. Rowbottom (1925).
2. *Arthur H. Greenwood* (1923).
3. *Frank Gardner* (1923).
4. *Harry C. Canfield* (1923).
5. Noble J. Johnson (1925).
6. Richard N. Elliott (1917).
7. Ralph E. Updike (1925).
8. Albert H. Vestal (1917).
9. Fred S. Purnell (1917).
10. William R. Wood (1915).
11. Albert R. Hall (1925).
12. David Hogg (1925).
13. Andrew J. Hickey (1919).

IOWA

1. William F. Kopp (1921).
2. F. D. Letts (1925).
3. T. J. B. Robinson (1923).
4. Gilbert N. Haugen (1899).
5. Cyrenus Cole (1921).
6. C. William Ramseyer (1915).
7. Cassius C. Dowell (1915).
8. Lloyd Thurston (1925).
9. Earl W. Vincent (1928).
10. L. J. Dickinson (1919).
11. William D. Boies (1919).

KANSAS

1. Daniel R. Anthony, Jr. (1907).
2. Ulysses S. Guyer (1926).
3. W. H. Sproul (1923).
4. Homer Hoch (1919).
5. James G. Strong (1919).
6. Hays B. White (1919).
7. Clifford R. Hope (1926).
8. *William A. Ayres* (1923).

KENTUCKY

1. *William V. Gregory* (1927).
2. *David H. Kincheloe* (1915).
3. *John W. Moore* (1925).
4. *Henry De Haven Moorman* (1927).
5. Maurice H. Thatcher (1923).
6. *Orie S. Ware* (1926).
7. *Virgil Chapman* (1925).
8. *Ralph Gilbert* (1921).
9. *Fred M. Vinson* (1924).
10. Katherine Langley (1927).
11. John M. Robsion (1919).

LOUISIANA

1. *James O'Connor* (1919).
2. *J. Zach Spearing* (1924).
3. *Whitmell P. Martin* (1915).
4. *John N. Sandlin* (1921).
5. *Riley J. Wilson* (1915).
6. *Bolivar E. Kemp* (1925).
7. *René L. DeRouen* (1927).
8. *James B. Aswell* (1913).

MAINE

1. Carroll L. Beedy (1921).
2. Wallace H. White, Jr. (1917).
3. John E. Nelson (1922).
4. Ira G. Hersey (1917).

MARYLAND

1. *T. Alan Goldsborough* (1921).
2. *William P. Cole, Jr.* (1927).
3. *Vincent L. Palmisano* (1927).
4. *J. Charles Linthicum* (1911).
5. *Stephen W. Gambrill* (1924).
6. Frederick N. Zihlman (1917).

MASSACHUSETTS

1. Allen T. Treadway (1913).
2. Henry L. Bowles (1925).
3. Frank H. Foss (1925).
4. George R. Stobbs (1925).
5. Edith Nourse Rogers (1925).
6. A. Piatt Andrew (1921).
7. *William P. Connery, Jr.* (1923).
8. Frederick W. Dallinger (1927).
9. Charles L. Underhill (1921).
10. *John J. Douglass* (1925).
11. George Holden Tinkham (1915).
12. *John W. McCormack* (1928).
13. Robert Luce (1919).
14. Richard B. Wigglesworth (1928).
15. Joseph W. Martin, Jr. (1925).
16. Charles L. Gifford (1922).

MICHIGAN

1. Robert H. Clancy (1927).
2. Earl C. Michener (1919).
3. Joseph L. Hooper (1925).
4. John C. Ketcham (1921).
5. Carl E. Mapes (1913).
6. Grant M. Hudson (1923).
7. Louis C. Cramton (1913).
8. Bird J. Vincent (1923).
9. James C. McLaughlin (1907).
10. Roy O. Woodruff (1921).
11. Frank P. Bohn (1926).
12. W. Frank James (1915).
13. Clarence J. McLeod (1923).

MINNESOTA

1. Allen J. Furlow (1925).
2. Frank Clague (1921).
3. August H. Andresen (1925).
4. Melvin J. Maas (1927).
5. Walter H. Newton (1919).
6. Harold Knutson (1917).
7. O. J. KVALE (1923).
8. WILLIAM L. CARSS (1925).
9. Conrad G. Selvig (1926).
10. Godfrey G. Goodwin (1925).

MISSISSIPPI

1. *John E. Rankin* (1921).
2. *B. G. Lowrey* (1921).
3. *W. M. Whittington* (1925).
4. *Jeff Busby* (1923).
5. *Ross A. Collins* (1921).
6. *T. Webber Wilson* (1923).
7. *Percy E. Quin* (1913).
8. *James W. Collier* (1909).

MISSOURI

1. *M. A. Romjue* (1923).
2. *Ralph F. Lozier* (1923).
3. *Jacob L. Milligan* (1923).
4. Charles L. Faust (1921).
5. *George H. Combs, Jr.* (1927).
6. *Clement C. Dickinson* (1923).
7. *Samuel C. Major* (1923).
8. *William L. Nelson* (1925).
9. *Clarence Cannon* (1923).
10. Henry F. Niedringhaus (1927).
11. *John J. Cochran* (1927).
12. Leonidas C. Dyer (1917).
13. *Clyde Williams* (1927).
14. *James F. Fulbright* (1927).
15. Joe J. Manlove (1923).
16. (Vacant).

MONTANA

1. *John M. Evans* (1923).
2. Scott Leavitt (1923).

NEBRASKA

1. *John H. Morehead* (1923).
2. Willis G. Sears (1923).
3. *Edgar Howard* (1923).
4. *John N. Norton* (1926).
5. *A. C. Shallenberger* (1923).
6. Robert G. Simmons (1923).

NEVADA

At large—Samuel S. Arentz (1925).

NEW HAMPSHIRE

1. Fletcher Hale (1925).
2. Edward H. Wason (1915).

NEW JERSEY

1. Charles A. Wolverton (1926).
2. Isaac Bacharach (1915).
3. Harold G. Hoffman (1927).
4. Charles A. Eaton '1925).
5. Ernest R. Ackerman (1919).
6. Randolph Perkins (1921).
7. George N. Seger (1923).
8. *Paul J. Moore* (1926).
9. Franklin W. Fort (1925).
10. Frederick R. Lehlbach (1915).
11. *Oscar L. Auf Der Heide* (1925).
12. *Mary T. Norton* (1925).

NEW MEXICO

At large—*John Morrow* (1923).

NEW YORK

1. Robert L. Bacon (1923).
2. *John J. Kindred* (1921).
3. *George W. Lindsay* (1923).
4. *Thomas H. Cullen* (1919).
5. *Loring M. Black, Jr.* (1923).
6. *Andrew L. Somers* (1925).
7. *John F. Quayle* (1923).
8. *Patrick J. Carley* (1927).
9. *David J. O'Connell* (1923).
10. *Emanuel Celler* (1923).
11. *Anning S. Prall* (1923).
12. *Samuel Dickstein* (1923).
13. *Christopher D. Sullivan* (1917).
14. *William I. Sirovich* (1927).
15. *John J. Boylan* (1923).
16. *John J. O'Connor* (1923).
17. *William W. Cohen* (1927).
18. *John F. Carew* (1913).
19. *Sol Bloom* (1923).
20. Fiorillo H. LaGuardia (1923).
21. *Royal H. Weller* (1923).
22. *Anthony J. Griffin* (1917).
23. *Frank Oliver* (1923).
24. *James M. Fitzpatrick* (1926).
25. J. Mayhew Wainwright (1923).
26. Hamilton Fish, Jr. (1920).
27. Harcourt J. Pratt (1925).
28. *Parker Corning* (1923).
29. James S. Parker (1913).
30. Frank Crowther (1919).
31. Bertrand H. Snell (1915).
32. Francis D. Culkin (1928).
33. Frederick M. Davenport (1925).
34. John D. Clarke (1921).
35. Clarence E. Hancock (1927.)
36. John Taber (1923).
37. Gale H. Stalker (1923).
38. *Meyer Jacobstein* (1923).
39. Archie D. Sanders (1917).
40. S. Wallace Dempsey (1915).
41. Clarence MacGregor (1919).
42. *James M. Mead* (1919).
43. Daniel A. Reed (1919).

NORTH CAROLINA

1. *Lindsay C. Warren* (1925).
2. *John H. Kerr* (1923).
3. *Charles L. Abernethy* (1922).
4. *Edward W. Pou* (1901).
5. *Charles M. Stedman* (1911).
6. *Homer L. Lyon* (1921).
7. *William C. Hammer* (1921).
8. *Robert L. Doughton* (1911).
9. *A. L. Bulwinkle* (1921).
10. *Zebulon Weaver* (1919).

NORTH DAKOTA

1. Olger B. Burtness (1921).
2. Thomas Hall (1924).
3. James H. Sinclair (1919).

OHIO

1. Nicholas Longworth (1915).
2. Charles Tatgenhorst, Jr. (1927).

3. Roy G. Fitzgerald (1921).
4. W. T. Fitzgerald (1925).
5. Charles J. Thompson (1919).
6. Charles C. Kearns (1915).
7. Charles Brand (1923).
8. *Brooks Fletcher* (1925).
9. W. W. Chalmers (1925).
10. Thomas A. Jenkins (1925).
11. *Mell G. Underwood* (1923).
12. John C. Speaks (1921).
13. James T. Begg (1919).
14. *Martin L. Davey* (1923).
15. C. Ellis Moore (1919).
16. *John McSweeney* (1923).
17. W. M. Morgan (1921).
18. Frank Murphy (1919).
19. John G. Cooper (1915).
20. *Charles A. Mooney* (1923).
21. *Robert Crosser* (1923).
22. Theodore E. Burton (1921).

OKLAHOMA

1. *E. B. Howard* (1923).
2. *William W. Hastings* (1923).
3. *Wilburn Cartwright* (1927).
4. *Tom D. McKeown* (1923).
5. *F. B. Swank* (1921).
6. *Jed Johnson* (1926).
7. *James V. McClintic* (1915).
8. M. C. Garber (1923).

OREGON

1. Willis C. Hawley (1907).
2. Robert R. Butler (1928).
3. Franklin F. Korell (1927).

PENNSYLVANIA

1. James M. Beck (1927).
2. George S. Graham (1913).
3. Harry C. Ransley (1920).
4. Benjamin M. Golder (1925).
5. James J. Connolly (1921).
6. George A. Welsh (1923).
7. George P. Darrow (1915).
8. James Wolfenden (1928).
9. Henry W. Watson (1915).
10. W. W. Griest (1909).
11. Laurence H. Watres (1923).
12. *John J. Casey* (1927).
13. Cyrus M. Palmer (1926).
14. Robert G. Bushong (1927).
15. Louis T. McFadden (1915).
16. Edgar R. Kiess (1913).
17. Frederick W. Magrady (1925).
18. Edward M. Beers (1923).
19. Isaac H. Doutrich (1926).
20. J. Russell Leech (1927).
21. J. Banks Kurtz (1923).
22. Franklin Menges (1925).
23. J. Mitchell Chase (1927).
24. Samuel A. Kendall (1919).
25. Henry W. Temple (1915).
26. J. Howard Swick (1927).
27. Nathan L. Strong (1917).
28. Thomas C. Cochran (1926).
29. Milton W. Shreve (1919).
30. *Everett Kent* (1923).
31. Adam M. Wyant (1921).
32. Stephen G. Porter (1911).
33. Clyde Kelly (1917).
34. John M. Morin (1913).
35. Harry A. Estep (1927).
36. Guy E. Campbell (1917).

RHODE ISLAND

1. Clark Burdick (1919).
2. Richard S. Aldrich (1923).
3. Louis Monast (1927).

SOUTH CAROLINA

1. *Thomas S. McMillan* (1925).
2. *Butler B. Hare* (1925).
3. *Fred H. Dominick* (1917).
4. *John J. McSwain* (1921).
5. *William F. Stevenson* (1917).
6. *Allard H. Gasque* (1923).
7. *Hampton P. Fulmer* (1921).

SOUTH DAKOTA

1. Charles A. Christopherson (1919).
2. Royal C. Johnson (1915).
3. William Williamson (1921).

TENNESSEE

1. B. Carroll Reece (1921).
2. J. Will Taylor (1919).
3. *S. D. McReynolds* (1923).
4. *Cordell Hull* (1923).
5. *Ewin L. Davis* (1919).
6. *Joseph W. Byrns* (1909).
7. *Edward E. Eslick* (1925).
8. *Gordon Browning* (1923).
9. *Finis J. Garrett* (1905).
10. *Hubert F. Fisher* (1917).

TEXAS

1. *Eugene Black* (1915).
2. *John C. Box* (1919).
3. *Morgan G. Sanders* (1921).
4. *Sam Rayburn* (1913).
5. *Hatton W. Sumners* (1913).
6. *Luther A. Johnson* (1923).
7. *Clay Stone Briggs* (1919).
8. *Daniel E. Garrett* (1921).
9. *Joseph J. Mansfield* (1917).
10. *James P. Buchanan* (1913).
11. *Tom Connally* (1917).
12. *Fritz G. Lanham* (1919).
13. *Guinn Williams* (1923).
14. Harry M. Wurzbach (1921).
15. *John N. Garner* (1903).
16. *C. B. Hudspeth* (1919).
17. *Thomas L. Blanton* (1917).
18. *Marvin Jones* (1917).

UTAH

1. Don B. Colton (1921).
2. Elmer O. Leatherwood (1921).

VERMONT

1. Elbert S. Brigham (1925).
2. Ernest W. Gibson (1923).

VIRGINIA

1. *Schuyler Otis Bland* (1918).
2. *Joseph T. Deal* (1921).
3. *Andrew J. Montague* (1913).
4. *Patrick H. Drewry* (1920).
5. *Joseph Whitehead* (1925).
6. *Clifton A. Woodrum* (1923).
7. *Thomas W. Harrison* (1923).
8. *R. Walton Moore* (1919).
9. *George C. Peery* (1923).
10. *Henry St. George Tucker* (1923).

WASHINGTON

1. John F. Miller (1917).
2. Lindley H. Hadley (1915).
3. Albert Johnson (1913).
4. John W. Summers (1919).
5. *Samuel B. Hill* (1923).

WEST VIRGINIA

1. Carl G. Bachmann (1925).
2. Frank L. Bowman (1925).
3. *William Smithe O'Brien* (1927).
4. James A. Hughes (1927).
5. James French Strother (1925).
6. Edward T. England (1926).

WISCONSIN

1. Henry Allen Cooper (1921).
2. Charles A. Kading (1927).
3. John M. Nelson (1921).
4. John C. Schafer (1923).
5. *VICTOR L. BERGER* (1923).
6. Florian Lampert (1918).
7. J. D. Beck (1921).
8. Edward E. Browne (1913).
9. George J. Schneider (1923).
10. James A. Frear (1913).
11. Hubert H. Peavy (1923).

WYOMING

At large—Charles E. Winter (1923).

ALASKA

Dan A. Sutherland (1921).

HAWAII

Victor S. K. Houston (1927).

PHILIPPINES

Pedro Guevara (1923).
(Vacant).

PORTO RICO

Felix Cordova Davila (1917).

CLASSIFICATION

SENATE	
Republicans	51
Democrats	44
Farmer-Labor	1
Total	96

HOUSE	
Republicans	235
Democrats	194
Farmer-Labor	2
Socialist	1
Total	432

FEDERAL ADMINISTRATIVE SERVICE

By William M. Schuyler

Associate Editor, The American Year Book

THE PRESIDENT AND VICE-PRESIDENT

President.—Calvin Coolidge, of Massachusetts (Republican). Sworn into office as President of the United States, August 3, 1923, in succession to the late President Harding. Re-elected to the presidency, November 4, 1924. Inaugurated for his first elective term, March 4, 1925.

Vice-President. — Charles Gates Dawes, of Illinois (Republican). Inaugurated Vice-President of the United States, March 4, 1925.

Secretary to the President.—Everett Sanders of Indiana succeeded C. Bascom Slemp, resigned, as Secretary to the President, March 4, 1924. Mr. Sanders was formerly a Representative in Congress from the Fifth District of Indiana.

Vacancy.—By Act of Congress, in the case of vacancy occurring in the office of President through the death or removal of both the President and the Vice-President, the Cabinet officers succeed to the presidency in the order indicated in the arrangement of the following summary of the executive departments:

DEPARTMENT OF STATE

Secretary of State.—Frank Billings Kellogg.

Under-Secretary of State.—J. Reuben Clark, Jr.

Assistant Secretaries of State.—Wilbur J. Carr.—William R. Castle, Jr.—Francis White.—Nelson T. Johnson.

Foreign Service Personnel Board.—Wilbur J. Carr, Assistant Secretary of State, chairman.—William R. Castle, Jr., Assistant Secretary of State.—Nelson T. Johnson, Assistant Secretary of State.—Edward J. Norton, chairman of the executive committee.—G. Howland Shaw, member of the executive committee.—James B. Stewart, member of the executive committee.

Solicitor.—Green H. Hackworth.

Economic Adviser. — Arthur N. Young.

Chief Clerk.—E. J. Ayers.

Assistant to the Secretary of State.—William H. Beck.

Chiefs of Divisions:

Far Eastern Affairs.—Stanley K. Hornbeck.

Latin-American Affairs.—Stokeley W. Morgan.

Western European Affairs.—J. Theodore Marriner.

Near Eastern Affairs.—G. Howland Shaw.

Mexican Affairs. — Arthur Bliss Lane.

Eastern European Affairs.—Robert F. Kelley.

Passport.—Ruth B. Shipley.

Publications.—Tyler Dennett.

Current Information.—Michael J. McDermott.

Foreign Service Administration.—Herbert C. Hengstler.

Protocol.—James Clement Dunn.

Treaty.—Charles M. Barnes.

Chiefs of Bureaus:

Accounts.—William McNeir.

Indexes and Archives.—David A. Salmon.

Translating.—Emerson B. Christie.

Chiefs of Offices:

Consular Commercial. — Frederick T. F. Dumont.

Coordination and Review. Margaret M. Hanna.
Visa.—Monnett B. Davis.
Executive Committee of Foreign Service Personnel Board. — Worthington E. Stewart.
Foreign Service Buildings.—Keith Merrill.

Editor of Laws of Congress.—Henry L. Bryan.

Disbursing Officer.—William F. Cramer.

TREASURY DEPARTMENT

Secretary of the Treasury.—Andrew W. Mellon.

Charged with the management of the national finances. He prepares plans for the improvement of the revenue and support of the public credit; superintends collection of the revenue; grants warrants for all moneys paid from and into the Treasury; controls construction of public buildings, coinage and printing of money, and the administration of the Coast Guard and the Public Health Service; ex-officio chairman of the Federal Reserve Board and of the Federal Farm Loan Board.

The Under-Secretary (in general charge).—Ogden L. Mills.
Assistants.—W. N. Thompson.—Charles R. Schoeneman.
Special Assistant.—Albert G. Redpath.

Assistant Secretary (in charge of fiscal offices).—Henry Herrick Bond.
Assistants.—(Same as for Under-Secretary, above.)

Assistant Secretary (in charge of public buildings and miscellaneous).—Carl T. Schuneman.
Assistants.—H. R. Sheppard.—L. C. Martin.

Assistant Secretary in Charge of Customs, Coast Guard and Prohibition.—Seymour Lowman.
Assistant.—Frank C. Rose.

Commissioner of the Public Debt.—William S. Broughton.

Deputy Commissioner of the Public Debt.—S. R. Jacobs.

Commissioner of Accounts and Deposits.—Robert G. Hand.

Deputy Commissioner of Accounts and Deposits.—D. W. Bell.

Chief Clerk.—F. A. Birgfeld.

Private Secretary to the Secretary of the Treasury.—John Kieley.

Chiefs of Divisions:
Appointments.—James E. Harper.
Bookkeeping and Warrants.—E. F. Bartelt.
Customs.—Ernest W. Camp.
Deposits.—E. D. Batchelder.
Loans and Currency.—C. N. McGroarty.
Paper Custody.—M. A. Emerson.
Public Debt Accounts and Audit. —M. R. Loafman.
Secret Service.—W. H. Moran.
Special Agency Service, Customs.—Nathaniel G. Van Doren.
Disbursing Clerk.—J. L. Summers.
Government Actuary.—Joseph S. McCoy.

Comptroller of the Currency.—Joseph W. McIntosh.

Has supervision of the national banks, their examination and reports; the preparation and issue of national bank circulation; the redemption and destruction of national bank notes. Ex-officio a member of the Federal Reserve Board; and in this capacity draws a salary of $7,000 in addition to his salary of $5,000 attached to the office proper of Comptroller of the Currency.

Treasurer of the United States.—H. Theodore Tate.

Charged with the receipt and disbursement of all public moneys deposited in the Treasury and sub-treasuries and in national bank depositories.

National Bank Redemption Agency. —George O. Barnes, superintendent.

Director of the Bureau of the Budget.—Herbert M. Lord.

Commissioner of Internal Revenue. —D. H. Blair.

Charged with general supervision of the collection of all internal revenue taxes, including the income tax, and the enforcement of internal revenue laws.

Bureau of Prohibition.—Commissioner.—James M. Doran.

Director of the Mint.—Robert J. Grant.

Has general supervision of the mints and assay offices.

Register of the Treasury.—W. O. Woods.

Federal Farm Loan Bureau.—Chairman (ex-officio).—Andrew W. Mellon, Secretary of the Treasury.

Farm Loan Commissioner and Executive Officer.—Eugene Meyer.

Bureau of Engraving and Printing.—Director, Alvin W. Hall.

Produces all the securities and similar work of the Government printed from steel plates.

Bureau of Public Health Service.—Surgeon General, Hugh S. Cumming.

Charged with the framing and enforcement of regulations for the prevention of the introduction and spread of contagious diseases; supervision in the quarantine service of the United States, and supervision of the marine hospitals.

The Coast Guard.—Commandant, Rear Admiral Frederick C. Billard.

Supervising Architect's Office.—Acting Supervising Architect.—James A. Wetmore.

Custom House.—Deputy Collector in Charge, Leo A. Gertman.

DEPARTMENT OF WAR

Secretary of War.—Dwight Filley Davis.

The Assistant Secretary of War.—Charles Burton Robbins.

Assistant Secretary of War.—F. Trubee Davison.

Assistant and Chief Clerk.—John C. Scofield.

Executive Assistant to Secretary of War.—John W. Martyn.

Assistant Chief Clerk.—John B. Randolph.

Disbursing Clerk.—Edwin M. Lawton.

Principal Clerk.—Frank M. Hoadley.

War Department General Staff.—Chief of Staff, Maj. Gen. Charles P. Summerall.

Office of the Chief of Cavalry.—Chief, Maj. Gen. Herbert B. Crosby.

Office of the Chief of Field Artillery.—Chief, Maj. Gen. Fred T. Austin.

Office of the Chief of Coast Artillery.—Chief, Maj. Gen. Andrew Hero, Jr.

Office of the Chief of Infantry.—Chief, Maj. Gen. Robert H. Allen.

Office of the Adjutant General.—The Adjutant General, Maj. Gen. Lutz Wahl.

Office of the Inspector General.—Inspector General, Maj. Gen. W. C. Rivers.

Office of the Judge Advocate General.—Judge Advocate General, Maj. Gen. E. A. Kreger.

Office of the Quartermaster General.—Quartermaster General, Maj. Gen. B. F. Cheatham.

Office of the Chief of Finance.—Chief of Finance, Maj. Gen. Roderick L. Carmichael.

Office of the Surgeon General.—Surgeon General, Maj. Gen. M. W. Ireland.

Office of the Chief of Engineers.—Chief, Maj. Gen. Edgar Jadwin.

Office of the Chief of Ordnance.—Chief, Maj. Gen. Clarence C. Williams.

Office of the Chief Signal Officer.—Chief, Maj. Gen. George S. Gibbs.

Office of the Chief of the Air Corps.—Chief of the Air Corps, Maj. Gen. J. E. Fechet.

Bureau of Insular Affairs.—Chief of Bureau, Maj. Gen. Frank McIntyre.

Philippine Government. — Governor General, Henry L. Stimson.

Porto Rico Government.—Governor, Horace M. Towner.

Militia Bureau.—Chief, Maj. Gen. Creed C. Hammond.

Office of the Chief of the Chemical Warfare Service.—Chief, Maj. Gen. Amos A. Fries.

The Army War College.—Commandant.—Maj. Gen. William D. Connor.

DEPARTMENT OF JUSTICE

Attorney General.—John Garibaldi Sargent.

Represents the United States in all legal matters.

Solicitor General. — William D. Mitchell.

Special Assistant to the Attorney General.—Paul A. Chase.

Assistant to the Attorney General.—William J. Donovan.

Assistant Attorneys General.—John Marshall, Mabel Walker Willebrandt, Herman J. Galloway, Bertice M. Parmenter, Oscar R. Luhring, George R. Farnum.

Assistant Attorney General, Customs Division.—Charles D. Lawrence.

Director Bureau of Investigation.—J. Edgar Hoover.

Private Secretary and Assistant to the Attorney General.—Ugo J. A. Carusi.

Chief Clerk and Administrative Assistant.—James W. Baldwin.

Assistant Chief Clerk and Appointment Clerk.—Charles B. Sornborger.

Division of Mails and Files.—Chief, Arthur Robb.

Division of Supplies and Printing.—Chief, Edward N. Bodholdt.

Librarian.—George Kearney.

Superintendent of Prisons.—Albert H. Conner.

Attorney in Charge of Pardons.—James A. Finch.

General Agent.—John W. Gardner.

Assistant General Agent.—H. J. McClure.

Disbursing Clerk.—Raymond D. Allison.

POST OFFICE DEPARTMENT

Postmaster General.—Harry Stewart New.

Private Secretary to Postmaster General.—Alice Mummenhoff.

Chief Clerk.—Audus T. Davis.

Assistant Chief Clerk.—Charles E. Warren.

Appointment Clerk.—Alice B. Sanger.

Disbursing Clerk.—Louis A. Delano.

Executive Assistant to the Postmaster General.—Joseph Stewart.

Office of Solicitor:

Solicitor.—Horace J. Donnelly.

Assistant Solicitor.—Walter E. Kelly.

Assistant Attorneys.—Calvin W. Hassell, Harold F. Jones, William L. Rhoads, Stewart E. Blassingham, Abraham B. Keefer, William C. O'Brien, John J. Gregory.

Division of Purchasing Agent: Purchasing Agent.—Thomas L. Degnan. Chief Clerk.—Alfred H. Keim.

Division of Post Office Inspectors: Chief Inspector.—Grant B. Miller.

First Assistant Postmaster General.—John H. Bartlett.

Second Assistant Postmaster General.—Warren Irving Glover.

Third Assistant Postmaster General.—Robert S. Regar.

Fourth Assistant Postmaster General.—H. H. Billany.

Comptroller.—William E. Buffington.

Assistant and Chief Clerk.—Terence H. Sweeney.

Expert Accountant.—Lewis M. Bartlett.

DEPARTMENT OF AGRICULTURE

Secretary of Agriculture.—William Marion Jardine.

Exercises supervision over agricultural industry. experiment stations, quarantine stations for imported cattle, inspection of foods and drugs, national forest reserves, and interstate game laws.

Assistant Secretary.—R. W. Dunlap.

Assistant to the Secretary.—F. M. Russell.

Administrative Assistant.—M. E. Eisenhower.

Director of Scientific Work.—A. F. Woods.

Director of Regulatory Work.—Walter G. Campbell.

Director of Extension Work.—C. W. Warburton.

Director of Personnel and Business Administration.—W. W. Stockberger.

Director of Information.—Nelson Antrim Crawford.

Agricultural Extension Service.—Director, C. W. Warburton.

Office of Experiment Stations.—Chief, E. W. Allen.

Weather Bureau.—Chief, Charles F. Marvin.

Bureau of Animal Industry.—Chief, John R. Mohler.

Bureau of Dairy Industry.—Chief, O. E. Reed.

Bureau of Plant Industry.—Chief, William A. Taylor.

Forest Service.—Forester and Chief, R. Y. Stuart.

Bureau of Chemistry and Soils.—Chief, Henry G. Knight.

Bureau of Entomology.—Chief, C. L. Marlett.

Bureau of Biological Survey.—Biologist and Chief, Paul G. Redington.

Bureau of Public Roads.—Chief, Thomas H. MacDonald.

Bureau of Agricultural Economics.—Chief, Nils A. Olsen.

Bureau of Home Economics.—Chief, Louise Stanley.

Librarian.—Claribel R. Barnett.

Packers and Stockyards Administration.—Directed by assistant chief of bureau.

Grain Futures Administration. — Chief, J. W. T. Duvel.

Insecticide and Fungicide Board.—C. C. McDonnell.

Plant Quarantine and Control Administration.—Chief, C. L. Marlatt.

DEPARTMENT OF COMMERCE

Secretary of Commerce.—William Fairfield Whiting.

Charged with promoting commerce, mining, manufacturing, shipping, fisheries, patents, and transportation.

Assistant Secretary. — Walter F. Brown.

Solicitor.—Ephraim F. Morgan.

Chief Clerk and Superintendent.—E. W. Libbey.

Disbursing Clerk.—Charles E. Molster.

Director of Supplies.—Walter S. Erwin.

Private Secretary to the Secretary.—Arthur W. Coombs.

Private Secretary to the Assistant Secretary.—Kenneth Macpherson.

Chiefs of Divisions:

Appointments.—Edw. J. Gardner.

Publications.—Thomas F. McKeon.

Supplies.—Walter S. Erwin.

Bureau of the Census.—Director, William M. Steuart.

Bureau of Foreign and Domestic Commerce. — Director, Julius Klein.

Bureau of Standards.—Director, George K. Burgess.

Bureau of Fisheries.—Commissioner, Henry O'Malley.

Bureau of Lighthouses.—Commissioner, George R. Putnam.

Coast and Geodetic Survey.—Director, E. Lester Jones.

Bureau of Navigation. — Commissioner, Arthur J. Tyrer.

Steamboat Inspection Service.—Supervising Inspector General, Dickerson N. Hoover.

Patent Office.—Commissioner, Thomas E. Robertson.

Bureau of Mines.—Director, Scott Turner.

Aeronautics Branch.—Director, Clarence M. Young.

Radio Division.—Chief, William D. Terrell.

DEPARTMENT OF LABOR

Secretary of Labor.—James John Davis.

Charged with the duty of fostering, promoting and developing the welfare of the wage earners of the United States.

Private Secretary to the Secretary of Labor.—John C. Meikle.

Office of the Assistant Secretary.—Assistant Secretary.—Robe Carl White.

Private Secretary to the Assistant Secretary.—Anna V. Moynihan.

Second Assistant Secretary.—W. W. Husband.

Private Secretary to the Second Assistant Secretary.—William J. Holbrook.

Assistants to the Secretary.—Arthur E. Cook and W. N. Smelser.

Solicitor.—Theodore G. Risley.

Office of the Chief Clerk:

Chief Clerk.—Samuel J. Gompers.

Disbursing Clerk.—R. P. Brown.

Chief, Division of Publications and Supplies.—Shelby Smith.

Appointment Clerk.—Robert C. Starr.

Librarian.—Laura A. Thompson.

Bureau of Labor Statistics.—Commissioner, Ethelbert Stewart.

Bureau of Immigration.—Commissioner General, Harry E. Hull.

Children's Bureau.—Chief, Grace Abbott.

Bureau of Naturalization.—Commissioner, Raymond F. Crist.

Women's Bureau.—Director, Mary Anderson.

U. S. Employment Service.—Director General, Francis I. Jones.

U. S. Conciliation Service.—Director, Hugh L. Kerwin.

DEPARTMENT OF THE NAVY

Secretary of the Navy.—Curtis Dwight Wilbur.

Assistant Secretary.—Theodore Douglas Robinson.

Assistant Secretary for Aeronautics.—Edward P. Warner.

Chief Clerk.—F. S. Curtis.

Private Secretary to the Secretary.—Alexander J. Doyle.

Private Secretary to the Assistant Secretary of the Navy.—Verne Simkins.

Chief of Appointment Division.—William D. Bergman.

Budget Clerk.—Roy H. Moses.

Disbursing Clerk.—A. H. Hoiland.

Chief of Division of Records.—Charles T. Ogle.

Office of Naval Operations.—Chief, Admiral Charles F. Hughes.

Bureau of Navigation.—Chief, Rear Admiral Richard H. Leigh.

Bureau of Yards and Docks.—Chief, Rear Admiral L. E. Gregory.

Bureau of Ordnance.—Chief, Rear Admiral William D. Leahy.

Bureau of Construction and Repair.—Chief, Rear Admiral J. D. Beuret.

Bureau of Engineering.—Engineer in Chief, Rear Admiral Harry E. Yarnell.

Bureau of Supplies and Accounts.—Paymaster General, Rear Admiral Charles Morris.

Bureau of Medicine and Surgery.—Chief, Rear Admiral E. R. Stitt.

Bureau of Aeronautics.—Chief, Rear Admiral William A. Moffett.

Office of Judge Advocate General of the Navy.—Judge Advocate General, Rear Admiral Edward H. Campbell.

Naval Consulting Board.—President, Thomas A. Edison.

Compensation Board.—Senior Member, Rear Admiral W. L. Capps.

General Board.—Admiral Charles F. Hughes, Maj. Gen. John A. Lejeune, Rear Admirals A. T. Long, Richard H. Jackson, J. V. Chase, H. H. Hough, J. R. P. Pringle; Capt. A. W. Johnson, Capt. W. R. Gherardi, Lieut. Col. L. C. Lucas, Commander Harold C. Train.

Board of Medical Examiners.—President, Rear Admiral A. M. D. McCormick.

Naval Examining Board.—President, Capt. C. A. Abele.

Naval Retiring Board.—President, Rear Admiral A. M. D. McCormick.

Naval Dispensary.—Capt. Charles M. Oman.

Navy Yard and Station, Washington, D. C.—Commandant and Superintendent Naval Gun Factory, Rear Admiral A. L. Willard.

Naval Medical School.—Capt. Charles S. Butler.

Naval Hospital.—Capt. Charles E. Riggs.

Attendance on Officers.—Commander George W. Calver.

Board for Examination of Medical Officers.—President, Capt. Charles S. Butler.

Board for Examination of Dental Officers.—Capt. Charles S. Butler.

Marine Corps.—Commandant, Maj. Gen. John A. Lejeune. Adjutant and Inspector, Brig. Gen. Rufus H. Lane.

DEPARTMENT OF THE INTERIOR

Secretary of the Interior.—Roy Owen West.

Charged with pensions, public lands, Indian affairs, geological surveys, reclamation of arid lands, and mines.

First Assistant Secretary.—Edward C. Finney.

Assistant Secretary.—John H. Edwards.

Administrative Assistant.—Ebert K. Burlew.

Chief Clerk.—W. Bertrand Acker.

Solicitor.—Ernest O. Patterson.

Assistant to the Solicitor.—Orlin H. Graves.

Board of Appeals.—George B. Gardner, William B. Newman, Alvah W. Patterson.

Supervisor of Classification.—John Harvey.

Chiefs of Divisions:

Disbursing.—J. B. Callahan.

Appointments, Mails and Files.—George E. Scott.
Publications.—Charles F. Glass.
Supplies.—Amos W. Hawk.
Traffic.—Charles E. Harris.
Medical Officer.—Charles E. O'Connor.

General Land Office.—Commissioner, William Spry.

Office of Indian Affairs.—Commissioner, Charles H. Burke.

Bureau of Pensions.—Commissioner, Winfield Scott.

Bureau of Education.—Commissioner, ———.

Geological Survey.—Director, George Otis Smith.

Bureau of Reclamation.—Commissioner, Elwood Mead.

National Park Service.—Director, Stephen T. Mather.

Board of Indian Commissioners.—Chairman, Samuel A. Eliot.

St. Elizabeth's Hospital.—Superintendent, William A. White, M.D.

Freedmen's Hospital. — Surgeon-in-Chief, William A. Warfield, M.D.

Howard University.—Patron ex-officio.—Roy O. West, Secretary of the Interior. President.—Mordecai W. Johnson.

Southern Appalachian National Park Commission.—Chairman, Henry W. Temple.

Territorial Officials:
Governor of Alaska.—George A. Parks.
Governor of Hawaii.—Wallace R. Farrington.

The Alaska Railroad.—General Manager, Otto F. Ohlson.

MISCELLANEOUS EXECUTIVE SERVICES

Smithsonian Institution. — Established 1846, under the terms of James Smithson's will, for the "increase and diffusion of knowledge among men." The former is accomplished by promoting original scientific research, and the latter by publication and lectures. The affairs of the Institution are managed by a Board of Regents. It cooperates with the Government and national scientific bodies.

Under the direction of the Smithsonian Institution are the National Museum, charged with preserving and utilizing objects of art and ethnological, geological and mineralogical collections belonging to the United States, and the Bureau of American Ethnology.

Secretary.—C. G. Abbot.

Government Bureaus Under the Direction of the Smithsonian Institution:
National Museum—Assistant Secretary in Charge.—Alexander Wetmore.
National Gallery of Art—Director, William H. Holmes.
Bureau of American Ethnology—Chief, M. W. Stirling.
International Exchanges — Secretary in Charge, C. G. Abbot.
National Zoological Park—Director, William M. Mann.
Astrophysical Observatory—Director, C. G. Abbot.

Regional Bureau for the United States International Catalogue of Scientific Literatures.—Assistant in Charge.—Leonard C. Gunnell.

National Academy of Sciences:
President.—Thomas H. Morgan.
Vice-President. — Frederick E. Wright.
Foreign Secretary.—R. A. Millikan.
Home Secretary.—David White.
Treasurer.—Joseph S. Ames.
Assistant Secretary.—Paul Brockett.

National Research Council.—Chairman, George K. Burgess.

Pan American Union.—Director General, L. S. Rowe.

General Accounting Office.—Comptroller General of the United States.—J. R. McCarl.

Civil Service Commission.—Commissioners—President, William C. Deming; George R. Wales, Jessie Dell.

Interstate Commerce Commission.—Johnston B. Campbell, Chairman; Balthasar H. Meyer, Clyde B. Aitchison, Joseph B. Eastman, Ernest I. Lewis, Frank McManamy, Thomas F. Woodlock, Richard V. Taylor, Ezra Brainerd, Jr., Claude R. Porter, Patrick J.

Farrell. Secretary.—George B. McGinty.

United States Bureau of Efficiency.—Chief, Herbert D. Brown.

U. S. Board of Mediation.—Samuel E. Winslow, Chairman.

Federal Reserve Board.—Chairman, Andrew W. Mellon, Secretary of the Treasury (ex-officio); J. W. McIntosh, Comptroller of the Currency (ex-officio).
Governor.—Roy A. Young.
Vice-Governor. — Edmund Platt; Adolph C. Miller, Charles S. Hamlin, Edward H. Cunningham, George R. James.
Secretary.—Walter L. Eddy.

Federal Trade Commission:
Commissioners: Chairman, William E. Humphrey; Abram F. Myers, Edgar A. McCulloch, Garland S. Ferguson, Jr., C. W. Hunt.
Secretary.—Otis B. Johnson.

United States Shipping Board.—Chairman.—T. V. O'Connor; E. C. Plummer, H. I. Cone, Albert H. Denton, Jefferson Myers, Samuel S. Sandberg, R. K. Smith. Secretary—Samuel Goodacre.

United States Shipping Board Merchant Fleet Corporation.—President, T. V. O'Connor. Vice-President.—E. C. Plummer. Secretary.—Samuel Goodacre.

United States Railroad Administration.—Director General, Andrew W. Mellon.

Board of Tax Appeals.—Chairman, Benjamin H. Littleton.

War Finance Corporation.—Chairman.—Andrew W. Mellon, Secretary of the Treasury.
Managing Director.—Eugene Meyer.
Directors.—George R. Cooksey, Floyd R. Harrison.

Alien Property Custodian.—Howard Sutherland.

United States Tariff Commission.—Chairman.—Thomas O. Marvin.
Vice-Chairman.—Alfred P. Dennis.
Commissioners.—Edgar B. Brossard, Sherman J. Lowell, Lincoln Dixon, Frank Clark.

United States Employees' Compensation Commission. — Chairman, Mrs. Bessie Parker Brueggeman; Harry Bassett, H. A. A. Smith.

United States Veterans' Bureau.—Director, Frank T. Hines.

National Screw Thread Commission.—Chairman, George K. Burgess, Director, Bureau of Standards.

Federal Board for Vocational Education.—Director, J. C. Wright.

Federal Power Commission.—Commissioners.—Dwight F. Davis, Secretary of War, chairman; Roy O. West, Secretary of the Interior;—William M. Jardine, Secretary of Agriculture;—Executive Secretary.—O. C. Merrill.

The Commission of Fine Arts.—Chairman, Charles Moore.

Personnel Classification Board.—Chairman, Carlos C. Van Leer; Guy Moffett, Victor G. Croissant.

Federal Oil Conservation Board.—Chairman, Advisory Committee, George Otis Smith.

Federal Radio Commission.—Chairman, Ira E. Robinson.

FEDERAL CIVIL SERVICE

By Clinton Rogers Woodruff

Honorary Secretary, National Municipal League

CIVIL SERVICE COMMISSION ANNUAL REPORT

Recommendations.—In its annual report for the year ended June 30, 1928, the Federal Civil Service Commission expressed the opinion that an amendment of the retirement law providing for optional retirement after 60 or 65 years of age and 30 years of service would prove a governmental economy; that its recent experience in searching into the life histories of applicants for the Bureau of Prohibition warranted the extension of such investigations to the prospective personnel of other law-enforcement agencies; and renewed its recommendations for the extension of the competitive examination system to all Presidential appointive posi-

tions which are not policy-determining, and also to all departments of the municipal government of the District of Columbia.

The Retirement Law.—In discussing the retirement law, the Commission stated: "An amendment providing for optional retirement after 60 or 65 years of age and 30 years of service would increase the efficiency of the service in two ways: (1) by relieving it of employees whose efficiency is impaired, though not to the extent of total disability; and (2) by allowing the prescribed retirement age to be sufficiently high to permit the retention of the more vigorous members of a group beyond the age when the weaker members should leave the service. As employees differ so greatly in physical and mental vigor at a given age, any retirement age prescribed for a group will be held too high or too low for most of its individual members. Retention of the most vigorous is provided for by the continuance provision of the act; but failing employees, unless totally disabled, must await the prescribed age, to the detriment of the service. The difference between salary and annuity would afford ample protection against the excessive use of an optional retirement provision. Under the present law, the average annuity is $721.39 or 52 per cent of the average annual salary for the last ten years. No annuity can exceed two-thirds of the salary, or $1,000. Few employees who feel able to continue at work would be permitted by their financial obligations to accept optional retirement at such a reduction of income."

Character and Fitness Tests.—The Commission has hitherto made no extensive use of tests involving personal investigation of character and suitability, except in the examination of candidates for the position of presidential postmaster. The personnel situation in the Prohibition Service suggested the necessity of subjecting those candidates who met the prescribed entrance requirements, to a thorough investigation of their experience, character, and general fitness, in order that the Commission might thus assure itself that all persons certified as suitable for responsible employment in the Bureau of Prohibition had demonstrated the required measure of ability and a conformity to acceptable standards of honesty and morality. A study of the results of this recent experience warranted the Commission in urgently recommending that there be extended to other law-enforcement agencies the system of investigations of character and fitness now followed for positions in the Bureau of Prohibition. It is shown in the report that of 21,129 applicants for the Prohibition Bureau examinations, only about 4,000 became eligible for appointment.

Fingerprinting.—In recent years the Commission, as a part of its character investigation, has employed fingerprinting of eligibles and searching of police records in a few of the larger cities. During the present year all applicants who passed the preliminary examinations for the Prohibition Service, in addition to a personal investigation, were fingerprinted. The limited use of this method has been successful in detecting persons with criminal records which had been concealed in their applications for examination, and the Commission has been granted a small appropriation for the coming fiscal year with which to establish a central fingerprint section in the Washington office where the fingerprints of all persons appointed to the service in certain of the larger cities will be filed after search has been made locally and through the Department of Justice Fingerprint Bureau.

Preference for Veterans.—The extent to which veterans profit by the provisions of the law and rules in their favor is shown by the following figures quoted from the report: "During the year, 231,425 persons entered examinations for the classified service, of whom 50,830, or slightly less than 22 per cent, were given preference. Of 37,796 appointments, 9,208, or 24.3 per cent, were of preference eligibles, whereas less than 22 per cent of all the applicants were in the preferred class. The number of preference eligibles appointed during the

year is more than 18 per cent of all preference applicants, whereas the number of non-preference appointees is less than 16 per cent of the whole number of non-preference applicants. In the past five years alone, 5,729 disabled veterans have been appointed to classified positions.

Employee Political Activity.—Few of the violations of the rule forbidding political activity by competitive employees which came to the attention of the Commission during the year were of a serious nature. They were mostly due to ignorance of the rule rather than willful violation. It is shown that, on the complaint of the Commission, certain employees of the San Francisco post office and the Phoenix, Arizona post office were removed from the service for pernicious political activity. The Collector of Internal Revenue at Phoenix was found to be the instigator and leader of the political activities of Federal officers and employees in that city in violation of the law and rules, and he was removed from office.

Suggestions for Legislation.—The Commission renewed its suggestion made in previous reports for legislation to place field presidential positions which are non-policy determining, such as collectors of customs and internal revenue and postmasters, in the classified service, dispensing with confirmation by the Senate and the four-year term of office, leaving to the President his discretionary power of making such rules and exceptions as he may deem necessary. It suggested legislation to extend the acts of Congress applying the competitive system of appointment, etc., to all the municipal departments of the government of the District of Columbia, as is done in other large cities of the country, and recommended legislation that the positions of deputy collector of internal revenue and deputy marshal be restored to the classified service.

UNITED STATES BUREAU OF EFFICIENCY

Staff and Functions.—The permanent staff of the U. S. Bureau of Efficiency on October 31, 1928, consisted of the chief, the assistant chief, 32 investigators, 4 scientists, 15 clerks, 3 messengers, and 1 under-laboratory apprentice, making a total force of 57. The Bureau's trained personnel includes experts in accountancy, in administrative audit, in statistics, in industrial engineering, in chemistry, in labor-saving devices, in office management, and in purchasing methods. It is their function to bring about better business methods and to reduce costs in the Government service; to investigate the duplication of statistical and other work; to investigate the needs of the executive departments and independent establishments with respect to personnel requirements; and to establish and maintain a standard system of efficiency ratings for the classified civil service in the District of Columbia.

Investigating Powers.—The duties and powers of the Bureau of Efficiency with reference to investigations in the Federal departments and independent establishments were extended by an Act of Congress approved May 16, 1928, to the municipal government of the District of Columbia. Further, the Bureau upon request makes studies of office organization and assists in the installation of new systems in the Federal and District services. It also conducts investigations for Congress and for Congressional committees.

Studies.—During the past year the Bureau made studies for the Treasury, Justice, Interior, and Commerce Departments, and for the Civil Service Commission and the municipal government of the District of Columbia. It also conducted studies for the Committees on Appropriations and for the Committees on the District of Columbia of the Senate and of the House of Representatives.

District of Columbia Fiscal Survey.—A survey of the fiscal relations existing between the Federal Government and the municipal government of the District of Columbia is being made for the Appropriations Committees of the Senate and the House of Representatives in charge of the District of Columbia appropriation bill. The purpose of this

study is to determine whether the amount now contributed by the Federal Government toward the support of the District of Columbia actually discharges the obligation of the Federal Government in the maintenance and upbuilding of the nation's capital.

Study of Municipal Taxation.—The Bureau's program for this survey includes a study of the entire field of municipal taxation with particular reference to the tax burden of cities of 300,000 population and over. Data are being collected from 13 such cities embracing the various forms of taxation in each city (including state and county taxes); the basis upon which each tax is levied, the exemption from taxation, all revenues from sources other than taxation, and the scale of governmental expenditures. It is the purpose of the Bureau to submit its report on this problem to the two committees above referred to at the coming session of Congress.

The Chief of the Bureau of Efficiency is one of the members *ex officio* of the Personnel Classification Board, established by Section 3 of the Act of Congress approved March 4, 1923, providing for the classification of civilian positions within the District of Columbia, including all positions under the government of the District of Columbia and in the field service of the Federal Government. He is also a member of the Board of Actuaries authorized by Section 16 of the Act of Congress approved May 22, 1920, for the retirement of employees in the classified civil service.

CIVIL SERVICE ASSEMBLY

New Constitution.—At the meeting of the Civil Service Assembly held in Denver, September 4-7, action of prime importance was taken. The most significant was the adoption of a new constitution which provides a new name for the organization, "The Civil Service Assembly of the United States and Canada"; set up an Executive Council of five to conduct the affairs of the Assembly between the annual meetings; restated the purposes with emphasis on service and research, and provided for regional conferences. At the request of the Executive Council, Ismar Baruch, of the United States Civil Service Commission, did the editorial work involved in preparing the summary of the proceedings.

Regional Groups.—Before leaving Denver, three regional groups formed tentative organizations and chose temporary officers. The representatives of the Eastern states group met and elected F. H. Densler as chairman and Mr. Baruch as secretary; tentative plans were made to hold a meeting of the group in Washington just before Easter. The middle states group met and chose R. O. Beckman as chairman and Herbert W. Cornell as secretary; a meeting of this group will be held, probably in Evanston, early in February. The Pacific Coast states group chose W. A. Johnstone as chairman and Mrs. Z. M. Tonney of the Los Angeles City Commission as secretary; a meeting will, at the invitation of Dr. Samuel C. May, Professor of Political Science, be held at the University of California in Berkeley about the middle of April. Mr. Foran expressed his intention of taking the initiative in bringing about the formation of a Canadian regional group.

The new constitution provides that the chairmen of the various regional groups, when the formal organization of the groups is completed and certification has been made, shall serve as vice-presidents of the Assembly.

New Officers Elected.—It was decided to hold the next meeting of the Assembly at Ottawa, Ontario. The officers elected under the new constitution were as follows: President (and Chairman of the Executive Council), Ellsworth Jeffrey, Cleveland Civil Service Commission; members of the Executive Council: Albert O. Allgeyer, Buffalo Civil Service Commission; Clifford N. Amsden, Los Angeles Civil Service Commission; Charles H. Bland, Civil Service Commission of Canada; Fred W. Smith, Detroit Civil Service Commission.

The Executive Council organized and elected as Secretary of the Assembly, Fred Telford of the Bureau of Public Personnel Administration and

as Treasurer, C. P. Messick, Chief Examiner and Secretary of the New Jersey State Civil Service Commission, who is also Acting Treasurer of the Bureau. This was for the purpose of bringing about a very close relationship between the Assembly and the Bureau; the Bureau is not only to do the secretarial and financial work of the Assembly but is to furnish the office and headquarters staff which the Executive Council is required under the new constitution to provide.

Publications.—The Executive Council, in cooperation with the Board of Trustees of the Bureau of Public Personnel Administration, has decided upon the publications of the two organizations. A *News Bulletin* will be issued from time to time at intervals not greater than two months. A statement of the organization and work of the Assembly, intended for the information of the members and also for use in extending the membership of the Assembly, will be prepared and made available not later than about April 1 of next year. At least four technical bulletins will be published jointly each year by the Assembly and the Bureau; the first of these, containing the report of the section on the development, adoption and administration of classification and compensation plans, was published in November.

THE MERIT SYSTEM IN THE STATES

The Michigan law providing for the merit system to be administered through a civil service commission in Wayne County (in which Detroit is located) has never been put into effect because a suit to test its legality was instituted in the courts. The circuit court for the County of Wayne handed down a decision upholding the validity of the law. This decision has been appealed to the State Supreme Court and is still in that court. As soon as the decision is rendered, the County Civil Service Commission will, if it is favorable to the law, be promptly organized.

Veteran Preference in Los Angeles.—In the primaries held in August an amendment was adopted by the voters of Los Angeles giving veterans the same preference which is accorded them under the city charter of Los Angeles City. This amendment provides that the Civil Service Commission must add ten points to the scores earned by veterans and by the wives and widows of disabled veterans.

Pending Proposals. — In Long Beach, California, the freeholders elected to make a revision in the existing city charter are considering a proposal to limit the jurisdiction of the Civil Service Commission to the police department and the fire department. A two-thirds vote is required for the approval of such an amendment if it is submitted. Three years ago when a similar proposal was voted on, it was defeated by a vote of about ten to one.

The Washington State Civil Service League has drafted a proposal for the establishment of the merit system to be administered through civil service commissions in class A and first class counties in Washington. By its terms it includes the counties in which Seattle, Tacoma, and Spokane are located. The Civil Service League will actively support the proposed measure in the forthcoming session of the legislature.

Classification Revision.—The New Jersey State Civil Service Commission, the Maryland State Employment Commission, and the Milwaukee County Civil Service Commissions have all been overhauling the classification and compensation plans originally adopted from 1918 to 1921. In New Jersey the detailed work has been done under the direction of Mr. Messick by J. L. Brown, Assistant Chief Examiner, and by Miss I. A. Haupt, Research Associate of the Bureau of Public Personnel Administration. In Maryland the work has been done by the State Employment Commissioner, with the assistance of Miss Haupt. In Milwaukee County Mr. Jennings is personally directing the work and Griffenhagen and Associates, Ltd., are giving technical assistance. It is expected that the revised classification and compensation plans will be printed and made avail-

able for department officers, the general public and interested personnel administrators early in 1929.

ATTITUDE OF POLITICAL PARTIES

Republican Stand on Classified Service.—Neither of the major political parties took a definite stand for the competitive classified service. They avoided commitment to any specific program for the improvement of Federal personnel administration. The Republican platform contained the following provisions affecting the Federal service:

"The merit system in government service originated with and has been developed by the Republican party. The great majority of our public service employees are now secured through and maintained in the government service under civil service rules. Steps have already been taken by the Republican Congress to make the service more attractive as to wages and retirement privileges, and we commend what has been done as a step in the right direction.

"The government today is made up of thousands of conscientious, earnest, self-sacrificing men and women, whose single thought is service to the nation. We pledge ourselves to maintain and, if possible, to improve the equality of this great company of Federal employees."

Democratic Platform Declaration.—The Democratic party platform plank declared: "Grover Cleveland made the extension of the merit system a tenet of our political faith. We shall preserve and maintain the civil service. Federal employees should receive a living wage based upon American standards of decent living. Present wages are in many instances far below that standard. We favor a fair and liberal retirement law for government employees in the classified service."

ATTITUDE OF PRESIDENTIAL CANDIDACY

Hoover.—In his speech of acceptance Mr. Hoover said: "Our civil service has proved a great national boon. Appointive office, both North, South, East and West, must be based solely on merit, character and reputation in the community in which the appointee is to serve, as it is essential for the proper performance of their duties that officials shall enjoy the confidence and respect of the people with whom they serve.

"One of the greatest difficulties of business with government is the multitude of unnecessary contacts with government bureaus, the uncertainty and inconsistency of governmental policies and the duplication of government activities. A large part of this is due to the scattering of functions and the great confusion of responsibility in our Federal organization. We have, for instance, fourteen different bureaus or agencies engaged in public works and construction, located in nine different departments of the government. It brings about competition between government agencies, inadequacy of control and a total lack of coordinated policies in public works. We have eight different bureaus and agencies charged with conservation of our natural resources, located in five different departments of the government. These conditions exist in many other directions. Divided responsibility, with the absence of centralized authority, prevents constructive and consistent development of broad national policies.

"Our Republican Presidents have repeatedly recommended to Congress that it would not only greatly reduce expenses of business in their contacts with government, but that a great reduction could be made in governmental expenditure and more consistent and continued national policies could be developed if we could secure the grouping of these agencies devoted to one major purpose under single responsibility and authority. I have had the good fortune to be able to carry out such reorganization in respect to the Department of Commerce. The results have amply justified its expansion to other departments, and I should consider it an obligation to enlist the support of Congress to effect it."

Smith.—Governor Smith in his acceptance speech severely criticized

the old method of selecting prohibition agents without examination. He said: "The President does not make the laws. He does his best to execute them whether he likes them or not. The corruption in enforcement activities which caused a former Republican prohibition administrator to state that three-fourths of the dry agents were political ward-heelers named by politicians without regard to civil service laws, and that prohibition is the 'new political pork barrel,' I will ruthlessly stamp out. Such conditions cannot and will not exist under any administration presided over by me.

"After seven years of Republican control the structure of government is worse than it was in 1921. It is fully as bad as the system which existed in New York State before we secured by constitutional amendment the legislation which consolidated more than one hundred offices, commissions and boards into eighteen coordinated departments, each responsible to the governor. In contrast with this, the Republican party in control at Washington, when faced with the alternative of loss of patronage for the faithful or more efficient and economical management of the government, permitted the old order to continue for the benefit of the patronage seekers.

"The appropriations for independent bureaus and offices not responsible to any cabinet officer increased from $3,400,000 in 1914 to $163,000,000 in 1921, and to $556,000,000 in 1928. No wonder that a cabinet officer of the Republican President of 1921 said 'if you could visualize the government as a business or administrative unit, you would see something like one of those grotesque spectacles of a big oyster shell to which in the course of years, big and irregular masses of barnacles have attached themselves without symmetry or relevancy.' And the Chamber of Commerce of the United States said in its annual report this year: 'No progress has been made on the plan of reorganization of the government's departments as advocated by the Chamber.' The administration spokesman answers only: 'We have given an economical administration,' and that has been repeated so often that some people begin to believe it without the slightest proof. I assert that there is no proof. . . .

"If the people commission me to do it, I shall with the aid of the Congress effect a real reorganization and consolidation of governmental activities upon a business basis and institute the real economy which comes from prudent expenditure. I shall aid programs for the relief of unemployment, recognizing its deep, human and social significance and shall strive to accomplish a national well-being resting upon the prosperity of the individual men and women who constitute the nation. . . .

"None can question my respect for and coöperation with the Civil Service nor my interest in proper compensation for government service. I believe in that true equality of women that opens to them without restriction all avenues of opportunity for which they can qualify in business, in government service and in politics. . . .

"I will not be influenced in appointments by the question of a person's wet or dry attitude, by whether he is rich or poor, whether he comes from the North, South, East or West, or by what church he attends in the worship of God. The sole standard of my appointments will be the same as they have been in my governorship—integrity of the man or woman and his or her ability to give me the greatest possible aid in devoted service to the people."

SELECTIVE TRAINING

Public Examiners.—Another development is the employment of a different type of examiner by public personnel agencies—the type of man and woman familiar with the principles and technique of test construction and the statistical evaluation of test results. Heretofore, examiners have been chosen because of their knowledge of some field of subject matter or for no good reason at all; there is now a strong movement to get those who have been trained in test-

ing and statistical work. The Cincinnati, Oakland, San Diego, Milwaukee and Maryland commissions have instituted the system and four other commissions are looking about for persons of this type to put on their staffs early in 1929.

Police training schools have been established in New York, Wisconsin, and Minnesota. The whole subject was discussed at the Richmond meeting of the American Municipal Association held in January, 1929.

Efficiency Ratings.—There is a growing recognition among public personnel administrators that the problem of service of efficiency ratings must be attacked and solved and the building up of organizations to make a successful attack. The Assembly has created a section to study this matter and the Bureau of Public Personnel Administration is giving it attention.

Short-Answer Tests.—In the matter of technical developments, there is to be noted that there is an increasing use of short-answer test material and the use of statistical devices to determine the results actually achieved. For several years, the Bureau of Public Personnel Administration has played a rather lone hand in this matter but now a large number of examiners on the regular staffs of civil service commissions are turning out short-answer test material in considerable volume.

NATIONAL CIVIL SERVICE REFORM LEAGUE

The 47th annual meeting of the National Civil Service Reform League was held in Philadelphia, April 25. The principal speech was that given by George McAneny, as President of of the League. Speeches were also made by William Dudley Foulke, former President of the League, and Elliott H. Goodwin, Civil Service Commissioner for the State of Massachusetts and former Secretary of the League. H. W. Marsh, who had been for eight years Secretary of the National Civil Service Reform League and the New York Civil Service Reform Association, and Editor of *Good Government*, resigned to accept the position of Civic Director of the City Club of New York.

CLASSIFIED SERVICE

During the administration of President Coolidge, he has extended by executive order the classified service to approximately 3,300 places heretofore subject to spoils appointments. Partly as the result of the President's earnest effort, the Congress has enacted by amendment to the Volstead Act a law to classify the prohibition agents and, in accordance with the recommendation of the President, the new law required all the incumbents of positions to compete with outsiders for the position. Of the things urged upon him by the National Civil Service Reform League which he might have done but which remain undone, two are of greater importance: (1) to require the Postmasters to select the person standing highest upon eligible lists for postmasters and rural carriers, thereby doing away with the evil of Congressional recommendations; (2) extension of the classified civil service by executive order to approximately 5,000 places within his jurisdiction in the Federal service, for which competitive examination is practicable.

INTERNAL REVENUE BUREAU

Congressional Committee on Taxation.—The Revenue Act of 1926 provided for the creation of a Joint Committee of Congress on Internal Revenue Taxation. The Committee was composed of Senators Smoot of Utah, Watson of Indiana, Reed of Pennsylvania, Republicans; and Simmons of North Carolina and Jones of New Mexico, Democrats; and from the House Representatives Green of Iowa, Hawley of Oregon and Treadway of Massachusetts, Republicans; Garber of Texas and Collier of Mississippi, Democrats. Congressman Green of Iowa was Chairman of this Committee. The Committee procured the services of an able staff and with the full coöperation of the officers of the Treasury Department it made a careful survey not only of the effect of the provisions of the Internal Revenue Taxation law, but also of the

character of the administration of the law and the organization of the Internal Revenue Bureau.

Status of Bureau Employees.—In its report to Congress on November 15, 1927, the Committee recommended among other things that all the employees in the field force of the Internal Revenue Bureau should be brought under the provisions of the Federal Civil Service Law and rules. To carry out this recommendation, the Congress would in effect have to repeal a provision of the Urgent Deficiency Law of 1913 which in a rider provided for the exemption from the civil service law of all deputy collectors of internal revenue and deputy United States marshals.

Bureau Organization Proposals.—The Joint Committee of Congress went further. It recommended that the field service of the Internal Revenue Bureau be reorganized so as to consolidate the offices of collectors with the offices of internal revenue agents. The Committee stated that in its survey of the existing form of organization, as conducted by the staff, it had estimated that over $2,000,000 a year would be saved by the government if the consolidation of these offices were effected and the entire personnel put in the classified civil service.

Outlook for Amended Law.—Although the three Republican members of the Joint Committee from the House were the ranking members on the Ways and Means Committee of the House, that Committee when it prepared a bill for the revision of the Internal Revenue Taxation law paid no attention to the recommendations of the Joint Committee so far as they pertained to classification of deputy collectors and reorganization of the field force of the Internal Revenue Bureau. An attempt to amend the bill on the floor of the House failed. Although there has been a definite demand from individuals and organizations throughout the country for this change in Internal Revenue Bureau organization, there now seems to be but small chance for the adoption of an amendment before the bill is passed. The political exigencies of a Presidential election were such as to lead the majority to proceed with caution or to proceed not at all in a matter that seriously affected political patronage.

STATE CIVIL SERVICE

New Jersey.—Outside of the Federal service the record is one of hope for the future rather than of much progress. In New Jersey attempts to weaken the State Civil Service system were frustrated. Although a legislative commission was appointed to investigate the Civil Service Commission, nothing has been done in that connection thus far and it is very probable nothing further will be done. Another County in New Jersey, Middlesex County, adopted the civil service law for the county service by a majority vote of over three thousand.

Nebraska and Texas.—In Nebraska, Governor-elect Weaver has taken a strong position for the merit system and it is hoped that a civil service law for that State may be enacted during his administration. Governor Moody of Texas has again espoused the merit principle and has stated that he would seek to have the Legislature adopt the civil service law for Texas.

California.—Mayor Cryer of Los Angeles appointed Kimpton Ellis, a member of the Council of the League and former Secretary of the Southern California Civil Service League, as a member of the Los Angeles Civil Service Commission. In most other jurisdictions, the League's problem has been to maintain what has thus far been gained.

Minnesota and Illinois.—The Minneapolis Civil Service Commission has been under fire for the past year. Serious attempts have been made to abolish the Commission and provide a Board made up of a number of department heads to administer the merit system. In Duluth, Minn., the Commission has practically ceased to function. In Illinois, particularly the City of Chicago, the civil service situation is chaotic.

PROHIBITION APPOINTMENTS

Commission Certification.—Certification for appointment of new pro-

hibition agents by the Civil Service Commission has been made in every district throughout the country except the two comprising New York City and up-state New York. The lists were submitted to the prohibition bureau about August 24 and it is believed that approximately three-fourths of the nearly two thousand agents will be replaced by new appointees. The certification for New York City and State have been held up to give the Civil Service Commission more time to investigate the character of the persons who have passed the written examinations and it is expected that the lists will be certified shortly.

Effect of Favoritism.—In an article in the September, 1928, issue of *Current History*, Herbert E. Morgan, Director of Recruiting, United States Civil Service Commission, reviews the history of appointments in the Prohibition Bureau. Mr. Morgan states that Dr. James M. Doran, Commissioner of Prohibition, "feels that appointments through political pressure or personal favor have been the curse of the prohibition enforcement organization." Morgan points out that in the eight years since the Volstead law became operative, 1,162 employees in the Federal prohibition force have been removed for delinquency or misconduct. In 551 of the cases the character of the offense warranted prosecution in the courts. Three state directors of Federal prohibition enforcement already have been sentenced and will have to serve penitentiary terms.

INVESTIGATION OF FEDERAL CIVIL SERVICE

Among the fourteen investigations authorized by the Senate were two to investigate conditions in the Federal civil service. Following published statements of William C. Deming, President of the U. S. Civil Service Commission, as to violation of the quota law in appointments to the Federal service in Washington, D. C., Senator Heflin of Alabama introduced a resolution directing the investigation of illegal civil service appointments and dismissals. The other resolution was sponsored by Senators George and Harris of Georgia, calling for an investigation of postmaster appointments. The scope of this investigation was originally limited to Georgia, but it has been extended to cover the entire country. It calls for an inquiry by the Post Office Department into "payment of money or anything of value to party officials or organizations" to influence appointments to Federal offices.

PERSONNEL

Elliott H. Goodwin was appointed by the Governor of Massachusetts to be Commissioner of Civil Service in that state, to succeed Payson Dana, deceased. Mr. Goodwin was Secretary of the National Civil Service Reform League from 1902-1912.

Lewis H. Fisher, formerly director of the Field Service, has been appointed Chief of the division of appointments of the Federal Commission, vice Dr. Thomas B. Chapman, deceased. He will also serve as assistant Secretary to the Commission.

PERSONNEL OF THE JUDICIARY

By William M. Schuyler

Associate Editor, The American Year Book

SUPREME COURT OF THE UNITED STATES

William Howard Taft (Ohio), Chief Justice, appointed 1921.

Oliver Wendell Holmes (Massachusetts), appointed 1902.

Willis Van Devanter (Wyoming), appointed 1910.

James Clark McReynolds (Tennessee), appointed 1914.

Louis Dembitz Brandeis (Massachusetts), appointed 1916.

George Sutherland (Utah), appointed 1922.

Pierce Butler (Minnesota), appointed 1922.

Edward Terry Sanford (Tennessee), appointed 1923.

Harlan F. Stone (New York), appointed 1925.

Officers of the Supreme Court:

Clerk.—Charles Elmore Cropley.

Deputy Clerks.—Horatio Stonier, Reginald C. Dilli.

Marshal.—Frank Key Green.

Reporter.—Ernest Knaebel.

CIRCUIT COURTS OF APPEALS OF THE UNITED STATES

First Circuit.—Mr. Justice Holmes; George Hutchins Bingham (New Hampshire); Charles F. Johnson (Maine); George W. Anderson (Massachusetts).

Second Circuit.—Mr. Justice Stone; Martin T. Manton (New York); Learned Hand (New York); Thomas W. Swan (Connecticut); Augustus N. Hand (New York).

Third Circuit.—Mr. Justice Brandeis; Joseph Buffington (Pennsylvania); J. Warren Davis (New Jersey); Victor B. Woolley (Delaware).

Fourth Circuit.—Mr. Chief Justice Taft; Edmund Waddill, Jr. (Virginia); John J. Parker (North Carolina); Elliott Northcott (West Virginia).

Fifth Circuit.—Mr. Justice Sanford; Richard W. Walker (Louisiana); Nathan P. Bryan (Florida); Rufus E. Foster (Louisiana).

Sixth Circuit.—Mr. Justice McReynolds; Arthur C. Denison (Michigan); Maurice H. Donahue (Ohio); Charles H. Moorman (Kentucky).

Seventh Circuit.—Mr. Justice Butler; George T. Page (Illinois); Julian W. Mack (Illinois); Samuel Alschuler (Illinois); Albert B. Anderson (Indiana); Evan A. Evans (Wisconsin).

Eighth Circuit.—Mr. Justice Van Devanter; Kimbrough Stone (Missouri); Robert E. Lewis (Colorado); William S. Kenyon (Iowa); Arba S. Van Valkenburgh (Missouri); Wilbur F. Booth (Minnesota); John H. Cotteral (Oklahoma).

Ninth Circuit.—Mr. Justice Sutherland; William B. Gilbert (Oregon); Frank H. Rudkin (Washington); William H. Hunt (California); Frank S. Dietrich (Idaho).

UNITED STATES COURT OF CUSTOMS APPEALS

William J. Graham (Illinois), presiding judge, appointed 1924.

Oscar E. Bland (Indiana), appointed 1923.

Charles Sherrod Hatfield (Ohio), appointed 1923.

Vacancy.

Vacancy.

COURT OF APPEALS OF THE DISTRICT OF COLUMBIA

George E. Martin, Chief Justice.

Charles H. Robb.

Josiah A. Van Orsdel.

COURT OF CLAIMS OF THE UNITED STATES

Fenton Whitlock Booth (Illinois), Chief Justice, appointed 1905.

Samuel Jordan Graham (Pennsylvania), appointed 1919.

McKenzie Moss (Kentucky), appointed 1926.

William Raymond Green (Iowa), appointed 1928.

Nicholas J. Sinnott (Indiana), appointed 1928.

SUPREME COURT OF THE DISTRICT OF COLUMBIA

Walter I. McCoy, Chief Justice.

Wendell P. Stafford.

Frederick L. Siddons.

William Hitz.

Jennings Bailey.

Peyton Gordon.

UNITED STATES CUSTOMS COURT

Israel F. Fischer, Chief Justice.

Byron S. Waite.

Charles P. McClelland.

Jerry B. Sullivan.

George Stewart Brown.

George E. Weller.

George Morley Young.

William J. Tilson.

Genevieve R. Cline.

UNITED STATES MARSHAL'S OFFICE

United States Marshal.—Edgar C. Snyder.

Chief Deputy Marshal.—Stephen B. Callahan.

UNITED STATES ATTORNEY'S OFFICE

United States Attorney, D. C.—Leo A. Rover.

Assistants.—John W. Fihelly, Raymond Neudecker, James J. O'Leary, David A. Hart, Rebekah S. Greathouse, Harold W. Orcutt, William H. Collins, M. Pearl McCall, Albert A. Stern, Neil Burkinshaw, John B. Williams, Thomas L. Jones, Joseph V. Connolly, Joseph C. Bruce, Walter M. Shea, Renah F. Camalier, Charles B. Murray, William A. Gallagher.

FEDERAL JUDICIAL PROSECUTIONS

By Walter C. Langsam

Department of History, Columbia University

CANDY

Case Against Pennsylvania Jobbers.—June 8 witnessed the culmination of a series of cases against associations of candy jobbers in various sections of the United States when a consent decree was entered in the Federal District Court in Pittsburgh in favor of the Government and against an association of 121 candy jobbers in nine Pennsylvania counties (United States *v.* Candy Supply Company). The Government's petition charged the jobbers with organizing the Candy Supply Company, incorporated under the laws of Maryland, as an instrumentality to restrain interstate trade and commerce in candy and confectionery products, and to fix and maintain certain prices on such products. It was also charged that the main purpose of the combination was to eliminate from the candy jobbing business in those counties such wholesale dealers as were willing to accept smaller profits, and therefore to sell precisely similar products at lower prices than the members of the combination. The court's decree perpetually enjoins the defendants from engaging in any of the various practices complained of, and ordered the dissolution of the Candy Supply Company.

QUININE CARTEL

In March the Department of Justice instituted three proceedings under the Sherman Act against a quinine syndicate controlled by the Dutch but having German, French, English, and American members (United States *vs.* N. V. Amsterdamsche Chininefabriek *et al.*). The complaints, filed in the District Court for the Southern District of New York, charged the cartel with monopolizing the production and distribution of quinine and other cinchona bark derivatives in the United States, and asked the court to prevent future restraint of trade in said products by the defendants. Inasmuch as the importance of quinine as a useful drug is out of all proportion to the actual monetary value ($2,000,000) of the annual imports, the Government felt that an adequate supply at a reasonable price should be available at all times. Since the Supreme Court in May, 1927, in United States *v.* Sisal Sales Corporation had decided that even foreign enterprises must submit to the American anti-trust laws if their commercial activities extended to this country, the District Court felt empowered to issue a consent decree on Sept. 20 permanently enjoining the syndicate from imposing any restrictions on the importation, sale or resale of quinine in the United States, discriminating between purchasers in the United States, or participating in any pooling agreements so far as American sales are concerned.

PAPER

On October 1 the Government filed an action in the District Court at Albany charging violation of the Sherman Anti-Trust Act by a conspiracy between several officers of the

International Brotherhood of Paper Makers and the Alden Paper Company of Holyoke, Mass. The defendants are charged with a conspiracy to monopolize the trade in union-made watermarked paper through an arrangement whereby the Alden Paper Company has been designated as sole distributor for all union-made paper. The union-made paper is identified by a distinctive, ineffaceable watermark consisting of the name and symbol of the Brotherhood. The mark is impressed by union-owned instruments known as dandy-rolls. A number of leading paper-making companies like the American Writing Paper Company of Holyoke, Mass., the Utica Paper Mills, Inc., of Potsdam, N. Y., and the Hopper Company of Taylorville, Ill., have become parties to the agreement, under which the Alden Paper Company receives a commission on all sales, whether they are due to its efforts or not. Moreover, the process of watermarking also increases the price of the paper to the consumer. Accordingly, the Government is seeking a decree nullifying the "arrangements making Alden's company exclusive distributor of the union-make products."

MOTION PICTURES

California.—The Department of Justice lodged a complaint with the Federal Court at Los Angeles Sept. 28, against the West Coast Theaters, Incorporated, and the eight leading distributors of motion pictures in Southern California, charging them with conspiracy to violate the anti-trust laws. The West Coast Theaters, Inc., operate about one-third the motion picture theaters in that part of California (approximately 100 out of 300). The defendants are accused of attempting to make it impossible for independent exhibitors to secure contracts on first or second run pictures, and to exclude from interstate trade and commerce in films all independent exhibitors who provide double feature programs, give premiums or presents to their patrons, or charge less than ten cents as the minimum admission price. It is also charged that a clearance schedule was drawn up by the West Coast Theaters, Inc., indicating the order in which each theater in the district concerned should exhibit any film, as well as the "number of days' protection which each prior run motion picture theater should have over each subsequent run motion picture theater in the exhibition of each such film." The distributors are said to have agreed to furnish films to the independent exhibitors only in accordance with this schedule. This, the Government alleges, interferes with the freedom of contract and is in restraint of trade.

Illinois and Oklahoma.—Similar proceedings were instituted in Chicago on December 15 against 17 corporations engaged in the film industry. The defendants comprise fourteen of the leading American distributors and three of the chief exhibitors of Illinois. On December 24 charges were filed in the District Court in Oklahoma City against an organization of theater owners operating throughout Oklahoma and Northern Texas. They are accused of conspiring to exclude from the interstate trade in films all non-theatrical exhibitors such as churches, schools and clubs.

New York.—Two important film cases, brought on April 27, are now pending in the District Court in New York City; namely, United States *v.* Paramount - Famous - Lasky Corporation *et al.* and United States *v.* First National Pictures, Inc., *et al.* The defendants in both cases are substantially the same; that is, all the leading film producers and distributors in the United States, and the 32 film boards of trade which they have set up throughout the country. In the first case the Government seeks to test the legality of certain uniform contracts between the distributors and exhibitors, especially those sections which provide for the arbitration of disputes arising under the contracts, and for the enforcement of the awards made by the boards. In the second case the Government contends that distributors "cannot agree among themselves as to the terms and conditions under which they will enter into contracts with new owners

or operators of motion picture theaters." A third complaint was brought against the Paramount corporation on August 1 before the Circuit Court of Appeals in New York City by the Federal Trade Commission. The Commission in this case appealed to the court for the enforcement of its order demanding that the corporation desist from the practice of "block-booking" whereby exhibitors are forced to lease films in blocks or groups on pain of foregoing the privilege to lease any portion or portions thereof.

OIL LEASE CASES

Salt Creek.—A number of further developments have taken place in connection with the oil lease prosecutions. Senator Walsh of Montana doubted the legality of the renewal of the lease and option on the oil from the Salt Creek district, adjoining Teapot Dome, which Secretary of the Interior Work granted to the Sinclair Crude Oil Purchasing Company in January, 1928, when the old contract expired. When the matter was brought to President Coolidge's attention he asked Attorney-General Sargent, on March 2, for his opinion. On October 16 this opinion was published. It held that the lease was null and void since the original option was illegal for the Secretary had no right to grant options. The Government delivery of oils was therefore stopped at once, and on October 30 a call for new bids was issued by Secretary West.

Blackmer Contempt.—In February, 1925, Harry M. Blackmer fled to France to avoid questioning in the Teapot Dome investigation. There an American consul served him with an order from the Supreme Court of the D. of C. demanding that he return to testify in the case of the United States *v.* Harry F. Sinclair and Albert B. Fall. Upon his refusal to return the court ordered him to appear before it on January 6, 1928, to answer a charge of contempt. Again he refused, and on March 21 the court decided (United States *v.* Harry M. Blackmer) that the defendant's property might be sold to satisfy a contempt judgment even though he lived abroad at the time the judgment is rendered. On August 4 President Coolidge and Secretary Kellogg signed a warrant for the arrest of Blackmer on a charge of perjury in connection with his income tax returns. But on December 4 the French Government refused the request of the United States for extradition, chiefly on the ground that in France a false declaration of income is a misdemeanor and not a crime.

Fall-Doheny Bribe Case.—Following a White House conference of November 15, Atlee Pomerene, special counsel for the Government in the oil cases, announced that the Government intended to prosecue the Fall-Doheny bribery indictments to their conclusion as soon as Mr. Fall's health permitted his undergoing trial.

PROHIBITION

"Rum Row."—So far as the enforcement of prohibition is concerned it appears that the Government is beginning to get control over liquor smuggling by water craft, both domestic and foreign. The courts are aiding greatly by a rapid disposition of the cases as they come up. On July 18 Dr. James Doran, Commissioner of Prohibition, declared that the "Rum Row" off the Atlantic Coast had been successfully broken up. Smuggling from Canada, however, continues to be a serious problem. The volume of that traffic has been increasing steadily.

Olmstead Case.—The number of prosecutions for violations of the Volstead Act in 1928 exceeded the number for 1927 by several thousands. On June 4 the Supreme Court rendered a five-to-four decision in the case of Olmstead *et al v.* United States (and two other similar cases), declaring evidence gained by wire-tapping to be usable at trials. The case arose in connection with an appeal by Roy Olmstead and others who had been convicted of violating the prohibition laws on evidence secured by the tapping of telephone wires.

RADIO

On October 16 the Department of Justice sought an injunction in the District Court in Chicago restraining

the American Bond and Mortgage Company, and Trianon, Inc., from operating radio broadcasting station WMBB-WOK without a license from the Federal Radio Commission. In defiance of an order of the Commission the defendants indicated their decision to resume operating the station on October 22 without a license. This complaint represents the first attempt of the Government to appeal to the courts to enforce compliance with the provisions of the Radio Act of 1927 under which the Federal Radio Commission was then established.

THE SUPREME COURT AND CONSTITUTIONAL LAW

By Howard Lee McBain

Ruggles Professor of Constitutional Law, Columbia University

CONSTITUTIONALITY OF ACTS OF CONGRESS

Tax on Gifts.—In the Revenue Act of June, 1924, Congress imposed a tax on gifts not made in contemplation of death. The Act applied to that year and every calendar year thereafter. In Blodgett *v.* Holden (275 U. S. 142), the Supreme Court held this act void as applicable to gifts made in 1924 prior to the date of the Act. In the opinion of the majority, as applicable to such gifts, the statute "was arbitrary and invalid under the due process clause of the Fifth Amendment." Four Justices dissented on the ground that the Act should not be construed to apply to such gifts. Thus was another statute added to the slowly mounting list of Acts of Congress which have fallen under the judicial ax by a sharply divided court. Both the majority and the minority declined to discuss the broader question of the validity of a tax on gifts, a question which was not specifically in the case.

Harrison Narcotic Drug Act.—This Act of 1914 was sustained by a five to four decision in 1919 (U. S. *v.* Doremous, 249 U. S. 86). It was, as is well known, a regulatory and penal statute to suppress illegal traffic in drugs; but in order to bring it within the range of congressional competence it was clothed in the disguise of a revenue measure. In 1926 the Supreme Court declared that the doctrine of the Child Labor Tax Case and of certain other recent cases might necessitate a review of the constitutionality of the Harrison Act if that question was again properly presented (U. S. *v.* Daugherty, 269 U. S. 360). In other words, the Court apparently invited an application for review. That review was had in Nigro *v.* United States (276 U. S. 332). The Act was again upheld; this time by a six-to-three decision. It was likewise liberally construed. Referring to the Doremous case the Court said that since that decision "this Court has held that Congress by merely calling an act a taxing act cannot make it a legitimate exercise of the taxing power." But the Court pointed out that the income from the tax had now become substantial. The Act was liberally construed also in Casey *v.* United States (276 U. S. 413), four Justices dissenting.

Delegation of Legislative Power.—The provision of the Fordney-Macumber Tariff Act which vests in the President the power to increase or decrease tariff rates after an investigation by the Tariff Commission in order to equalize the difference between the cost of production at home and abroad, was held not to be an unconstitutional delegation of legislative power (Hampton *v.* United States, 276 U. S. 394). Although the provision goes somewhat further than any previous act this decision was in line with former decisions on similar points. It is a curious fact that although the question of the constitutionality of a tariff for protection has been politically moot for a century or more that question was for the first time passed upon by the Supreme Court in this case in 1928.

Delegation of Executive Power.—The Organic Act of the Philippine Islands declares that "all executive functions of the government must be directly under the Governor General or within one of the executive departments under the supervision and control of the Governor General." The Philippine legislature created a series of government-controlled corporations and vested the voting power of the government's stock in a board consisting of the Governor General, President of the Senate, and Speaker of the House of Representatives. These acts were held void as being in conflict with the provision of the fundamental law of the Islands. In effect they delegated the executive functions conferred upon the Governor General to a board consisting in major part of legislative officers. Moreover, the mere failure of Congress to exercise its reserve power to annul any statute of the Philippine legislature did not render the statute valid by the implied sanction of Congress (Springer *v.* Philippine Islands, 277 U. S. 189).

PERSONAL RIGHTS AGAINST THE STATES

Zoning.—That the decision of the Supreme Court in the Euclid Zoning case (272 U. S. 365) has been widely misconstrued by state courts was shown in the decision of Nectow *v.* Cambridge (277 U. S. 183). A general zoning ordinance of Cambridge, similar to that involved in the Euclid case, operated to cut off 100 feet in width at one end of a person's tract of land and put it in an exclusive residence district. The Court below referred the matter to a master who found that "no practical use can be made of the land in question for residence purposes" and that putting it in the residence district "would not promote the life, safety, convenience, or general welfare of the inhabitants of that part of the defendant city." On the basis of the Euclid case the state court nevertheless upheld the ordinance as applicable to this piece of land, which the Supreme Court reversed, basing its judgment on the finding of the special master. As applicable to the plaintiff the ordinance was held to deprive him of property without due process of law. Under this decision it seems clear that the Supreme Court is ready to right individual wrongs under general zoning ordinances where the injury can be specifically shown and where, in the opinion of someone other than the zoning authority, the particular application of the ordinance does not conduce to the promotion of the usual subjects of the police power.

Cooperative Marketing.—In relatively recent years cooperative marketing statutes have been enacted and have been upheld and construed in a large number of states. These statutes are almost standard in form. The provisions which protect contracts between producers and cooperative associations from interference by punishing outsiders who attempt to secure their breach do not deprive any person of the liberty guaranteed by the Fourteenth Amendment; nor do they deny the equal protection of the laws. "Undoubtedly," said the Court, "the statute does prohibit and penalize action not theretofore so restricted and to that extent interferes with freedom. But this is done to protect certain contracts which the legislature deemed of great importance to the public and peculiarly subject to invasion. We need not determine whether the liberty protected by the Constitution includes the right to induce a breach of contract between others for the aggrandizement of the intermeddler—to violate the nice sense of right which honorable traders ought to observe." (Liberty Warehouse Co. *v.* Burley T. G. Cooperative M. Assn., 276 U. S. 71.)

Public Hack Stands.—A town may not establish a public hack stand upon the privately-owned station grounds of a railroad company. This would be taking property without due process of law. The company must allow the public ingress to and egress from a station; but it has full power to enter into contract with a single taxicab owner for a monopolistic use of its grounds as a cabstand. Despite the contract which the company had made with a single owner, the town

had refused to give him the additional licenses which he required in order to supply the needs of the public. This refusal was of course within the power of the town. Presumably the deadlock was somehow settled, though naturally the manner of settlement is not disclosed in the case (D. L. & W. Rd. Co. *v.* Morristown, 276 U. S. 182).

Insurance Rates.—A Missouri statute conferred upon the State Superintendent of Insurance power to reduce fire insurance rates after an investigation, expressly authorizing a review by the state court of the reasonableness of the rates so fixed. One hundred and fifty-six companies joined in an action to set aside an order of the superintendent. The Supreme Court refused to intervene on the ground that there was no showing that the rate was confiscatory as to any specific company. Said the Court: "The petitioners are competitors and each carries on business for itself. While they may, by joint action, pursue the remedy given by § 6284, it does not follow that the Constitution safeguards aggregate profits sufficiently to constitute just compensation for all the companies. The complaint fails to show any joint interest or right in or to the business covered by the rates or the protection sought to be invoked. And it fails to show that the business in Missouri of each is so well and economically organized and carried on that petitioners are entitled, as a right protected by the Constitution, to have premiums amounting in the aggregate to enough to yield a reasonable return or profit to all the companies." (Aetna Insurance Company *v.* Hyde, 275 U. S. 440.)

Workmen's Compensation.—It is no deprivation of property without due process of law to require an employer to pay compensation for the death of an employee resulting from crossing railroad tracks adjacent to the employer's plant. The crossing was not a public crossing, but it was a convenient crossing, and the employer knew of the practice of employees in using it and had not forbidden this practice: (Bountiful Brick Co. *v.* Giles, 276 U. S. 154.)

Accidents Caused by Non-Resident Motorists.—States have had a good deal of trouble in enacting laws that would hold non-resident motorists to reasonable account for accidents resulting from negligent driving. It has been held that mere entrance into the state is sufficient to appoint a state officer for the purpose of receiving service in an action brought against a non-resident motorist. In Hess *v.* Pawlaski (274 U. S. 352), it was further held that personal service was unnecessary. But the Court held void a New Jersey statute which it construed as not requiring that the Secretary of State, upon whom service might be made, should give reasonable notice to the non-resident defendant sued for damages. The opinion was expressed that "the state may properly authorize service to be made on one of its own officials, if it also requires that notice of that service be communicated to the person sued. Every statute of this kind, therefore, should require the plaintiff bringing suit to show in the summons to be served the postoffice address or residence of the defendant being sued, and should impose either on the plaintiff himself or upon the official receiving service or some other, the duty of communication by mail or otherwise with the defendant." The entire Court agreed with this view; but three Justices thought that since the statute had never been construed by the state court as not requiring notice, that court should have the opportunity first to pass upon the meaning of its own law. (Wuchter *v.* Pizzutti, 276 U. S. 204.)

Inheritance Taxes.—To the series of cases that have decided what a state may and may not tax under inheritance tax laws was added another clarifying decision. Interest in a partnership is a chose in action. Though the partnership be in another state such interest may be taxed in the state of the residence of the decedent. Of the same character are bonds in a safe deposit box and bank accounts in another state, as of course are stocks. But cash in the form of

bank notes and coin which are in a safe deposit box outside the state of the decedent is tangible personal property, which, under the rule of the Frick case, is subject to taxation only in the state in which it is found. (Blodgett *v.* Silberman, 277 U. S. 1.)

Infected Trees.—A Virginia statute required destruction without compensation for their value of cedar trees infected with cedar rust when in the neighborhood of apple orchards. This is not a deprivation of property without due process. "On the evidence we may accept the conclusion of the Supreme Court of Appeals that the state was under the necessity of making a choice between the preservation of one class of property and that of another, wherever both existed in dangerous proximity. It would have been none the less a choice if, instead of enacting the present statute, the state, by doing nothing, had permitted serious injury to the apple orchards within its borders to go unchecked. When forced to such a choice the state does not exceed its constitutional powers by deciding upon the destruction of one class of property in order to save another which, in the judgment of the legislature, is of greater value to the public. It would not do to say that the case is merely one of a conflict of two private interests and that the misfortune of the apple growers may not be shifted to cedar owners by ordering the destruction of their property; for it is obvious that there may be, and that there is, a preponderant public concern in the preservation of the one interest over the other." (Miller *v.* Schoene, 276 U. S. 272.)

Mortgage Recording Tax. — A mortgage recording tax of the state of Kentucky which exempted from its operation mortgages maturing in less than five years was, by a five to four decision, declared void as a denial of the equal protection of the laws. In a vigorous and convincing dissent Justice Brandeis cited the large number of instances in which "classifications based solely on factual differences no greater than that between a loan maturing in fifty-nine months or less and one maturing in sixty months or more have been sustained in many fields of legislation." (Louisville Gas & Electric Co. *v.* Coleman, 277 U. S. 32).

Corporation Taxes.—It had previously been held that a tax on the net income of corporations may be larger than a similar tax on natural persons or partnerships. (Flint *v.* Stone-Tracey Co., 220 U. S. 107). It had been held also that a franchise tax may be imposed on corporations in addition to other taxes, thus increasing their tax burden as compared with that of natural persons and partnerships. (Home Insurance Co. *v.* New York, 134 U. S. 594). It is now held, however, that a tax on gross receipts which imposes a heavier burden is void as denying the equal protection of the laws. The reason given is that it "can be laid upon receipts belonging to a natural person quite as conveniently as upon those of a corporation. It is not peculiarly applicable to corporations as are taxes on their capital stock or franchises." While this may be true, it is also true that a tax on net income is in no wise peculiar to corporations, and on this ground three Justices dissented. (Quaker City Cab Co. *v.* Pa., 277 U. S. 389).

Exclusion from Schools.—A state law which excludes Chinese from schools for white children and which in effect compels such an excluded child to attend either a school for colored children or a private school is not a denial of the equal protection of the laws. (Gong Lum *v.* Rice, 275 U. S. 78).

LIQUOR PROHIBITION LAWS

Searches and Seizures.—It is a well-settled rule of Federal jurisprudence that evidence which is unlawfully seized by Federal officers may not be used in a criminal prosecution. It is also a rule that evidence stolen by a private person and placed at the disposal of the prosecuting attorney may be so used. As a result of these rules intoxicating liquor that is seized by state officers under circumstances that would make the seizure unlawful if made by a Federal officer may nevertheless be used in criminal

prosecutions in the Federal courts. An exception to this rule is now laid down (Gambino *v.* U. S., 275 U. S. 310). If a state has no liquor law of its own a search and seizure that is made by state or local officers for the purpose of turning evidence over to Federal authorities must be a search and seizure that would be lawful if made by Federal officers. Otherwise the evidence may not be employed against the accused. The difference is that in such a state the state or local officers must be acting on behalf of the United States. The result, however, is obviously curious. Evidence which is perfectly good in one Federal jurisdiction is wholly useless in another because of the absence of a state enforcement law.

It was declared that "the requirement that warrants shall particularly describe the things to be seized makes general searches under them impossible and prevents the seizure of one thing under a warrant describing another. As to what is to be taken nothing is left to the discretion of the officer executing the warrant." (Marron *v.* U. S., 275 U. S. 192.) The question involved was whether prohibition agents acting under a warrant authorizing a search for liquor were justified in seizing books and papers. It was held that in the circumstances of this case they were so justified because upon making the search they discovered a crime that was being committed in their presence. They therefore "had a right without a warrant contemporaneously to search the place in order to find and seize the things used to carry on the criminal enterprise."

It was held that the provision of the constitution against unreasonable searches and seizures did not prevent the introduction of evidence secured by the tapping of telephone wires. There is no Federal law authorizing wire tapping. The case merely held that the constitution did not prohibit it. This ruling was reached by a most literal interpretation of the Fourth Amendment. Telephone wires, said the Court, are not a part of the defendant's house or office any more than are the highways along which they are stretched. (Olmstead *v.* U. S., 277 U. S. 438.) There was vigorous dissent by four members of the Court. Justice Holmes bluntly called the action of the government "dirty business," and Justice Brandeis, in a masterly opinion, pointed out the dangerous consequences of the doctrine of the majority in the light of the inventions of modern science.

Padlocking.—The owner of property that is padlocked under the Volstead Act, who made no move to terminate a terminable lease until the beginnings of proceedings to effect the padlock, two months after he had read in the newspapers of the raid upon his property, has no ground for complaint against the injunction, even though he may have been innocent of the unlawful use of his property. It was not declared that he would have had ground for this complaint if he had terminated the lease at once. The law offers some measure of protection to innocent owners by allowing to the judge discretion to lift the padlock upon the giving of a bond by the innocent owner. (Grossfield *v.* U. S., 276 U. S. 494.)

COMMERCE

What Is Interstate and Foreign Commerce?—The Standard Oil Company brought oil by boat to the seaboard in Florida from Mexico and from other states. It was stored in bulk and subsequently distributed throughout Florida. The Court held that "the seaboard storage stations are the natural places for a change from interstate and foreign transportation to that which is intrastate and there is nothing in the history of the whole transaction which makes them otherwise, either in intent or in fact." The oil thus stored in bulk was in consequence subject to taxation by the state. (Atlantic Coast Line Rd. Co. *v.* Standard Oil Co., 275 U. S. 257).

So likewise fish caught in the Gulf of Mexico and brought to a wharf in Texas where the fish were headed, gutted, and iced, and thereafter shipped, are property which is subject to state taxation. The court did

not pass on the question whether these fish were or were not imports. Even if they were, the process at the wharf operated to mix them with the general property of the state for purposes of taxation. (Gulf Fisheries Co. *v.* MacInerney, 276 U. S. 123).

Interstate Motor Buses.—A municipal license fee imposed upon motor buses that are engaged exclusively in interstate business is void unless the fee is no larger than the amount reasonably required to defray the expense of administering police regulations or unless it is only a fair contribution to the cost of maintaining the highways. A tax may be imposed on one who does both an interstate and an intrastate business, but it may be imposed solely on the intrastate business and this may be done only if this latter business can be discontinued without withdrawing also from the interstate business. If a license fee falls in none of these categories it is void as a burden upon interstate commerce. Bus owners, however, even though engaged exclusively in interstate commerce, may be required to take out liability insurance in favor of persons other than their passengers. (Sprout *v.* South Bend, 277 U. S. 163).

In another case it was held that a tax as an excise or the use of the highways which was imposed on interstate busses was not invalid because intrastate busses were taxed on their gross receipts. In order to show that the tax was a burden on interstate commerce it would be necessary to prove that it was discriminatory in its economic burden. This the case did not disclose. (Interstate Buses Corporation *v.* Blodgett, 276 U. S. 245).

COGNATE SOCIETIES

AMERICAN ACADEMY OF POLITICAL AND SOCIAL SCIENCE.—3622 Locust St., West Philadelphia, Pa.

AMERICAN BAR ASSOCIATION.—209 S. La Salle St., Chicago, Ill.

AMERICAN CONSTITUTIONAL LEAGUE. —27 William St., New York, N. Y.

AMERICAN DEFENSE SOCIETY, INC.— 154 Nassau St., New York, N. Y.

AMERICAN POLITICAL SCIENCE ASSOCIATION.—Angell Hall, Univ. of Michigan, Ann Harbor, Mich.

AMERICAN RIGHTS LEAGUE.—2 W. 45th St., New York, N. Y.

BETTER GOVERNMENT LEAGUE.—Washington, D. C.

CITIZENS' LIBERTY LEAGUE, INC.—289 Lenox Ave., New York, N. Y.

CIVIL SERVICE FORUM.—1756 46th St., Brooklyn, N. Y.

COMMERCIAL LAW LEAGUE OF AMERICA.—137 S. La Salle St., Chicago, Ill.

HONEST BALLOT ASSOCIATION, INC.— 120 Broadway, New York, N. Y.

LEAGUE FOR AMERICAN CITIZENSHIP, INC.—342 Madison Ave., New York, N. Y.

LEAGUE FOR POLITICAL EDUCATION. —113 W. 43rd St., New York, N. Y.

LEAGUE FOR PUBLIC DISCUSSION.—500 Fifth Ave., New York, N. Y.

NATIONAL ASSOCIATION OF LEGAL AID ORGANIZATIONS.—133 S. 12th St., Philadelphia, Pa.

NATIONAL ASSOCIATION FOR CONSTITUTIONAL GOVERNMENT. — 716 Colorado Building, Washington, D. C.

NATIONAL CIVIL SERVICE REFORM LEAGUE.—8 W. 40th St., New York, N. Y.

NATIONAL INSTITUTE OF PUBLIC ADMINISTRATION. — 261 Broadway, New York, N. Y.

NATIONAL STATE ASSOCIATION.—644 Drexel Bldg., Philadelphia, Pa.

VOTERS' EDUCATIONAL LEAGUE.—524 First Ave., New York, N. Y.

DIVISION IV

STATE GOVERNMENT

NATIONAL AND INTERSTATE RELATIONS OF STATES

By John M. Mathews

Professor, University of Illinois

Taxation.—National and state activities have important points of contact in connection with such matters as taxation and prohibition. Florida, which does not have an inheritance tax, is still vexed on account of the provision of the Federal inheritance tax granting an 80 per cent deduction for states that have an inheritance tax. Governor Martin of that State, in his message to the legislative session of 1928 characterized this feature of the Federal inheritance tax law as an "iniquitous measure, passed for no other reason than to nullify Florida's constitution, a gross injustice to the people of the State."

Prohibition.—As a repercussion of the criticism of the Eighteenth Amendment to the Constitution of the United States that it was ratified without definite evidence of popular approval, Governor Smith of New York, in his message to the Legislature, recommended that a provision should be inserted in the State constitution prohibiting the legislature from ratifying proposed amendments to the Constitution of the United States until after a state-wide popular referendum. This recommendation, however, disregards the legal principle that the Legislature, in ratifying an amendment to the Constitution of the United States, acts as an agent of the National Government and its action, therefore, cannot be controlled by the state constitution.

Federal Aid to States.—The system of Federal aid to the states in such matters as education, good roads, etc., continues to develop. Devotees of states rights principles look askance upon the expansion of this system, but the states themselves show no aversion to the acceptance of such aid. In October the report of the Committee on Federal Aid to the States of the National Municipal League, prepared by Professor A. F. MacDonald of the University of Pennsylvania, was issued. According to this report, Federal aid has greatly stimulated state activity in various directions. It has, for example, led to the construction of a much more comprehensive system of state roads than would otherwise have been possible. It has raised state standards and has been administered without undue Federal interference in state affairs. It has not been influenced by partisan politics and has placed no undue financial burden upon any section of the country.

State Apportionment in Congress.—The failure of Congress to make a reapportionment of representatives in the lower house of Congress upon the basis of population as determined by the census of 1920, in spite of the constitutional mandate, has been bitterly denounced by the representatives of certain states which would be entitled to an increase of representation if such a reapportionment were made. This failure also adversely affects the representation of such states in the electoral college. It was even alleged in some quarters that the failure of Congress to reapportion might have the effect of invalidating the presidential election of 1928. Fortunately, however, the election was not close enough to bring up this question in a practical form.

STATE CONSTITUTIONS

By Frederic H. Guild

Professor, University of Kansas

CONSTITUTIONAL DEVELOPMENTS

Among the most significant constitutional developments of 1928 were: —the general revision of the Virginia Constitution, adopted June 19; Florida's partial abandonment of special legislation for cities; the authorization of a state highway system for Kansas; the calling of a constitutional convention for 1929 in New Hampshire; senatorial reapportionment and the repeal of the property qualification in Rhode Island; authorization of consolidation of local governments in Alleghany County as the City of Pittsburgh; and the abandonment of the split session by West Virginia.

VIRGINIA

Administrative Reorganization. — The Virginia revision involving 47 major changes provided a short ballot and left the way open for legislative reorganization of state administration after 1932. The Secretary and Treasurer of the commonwealth, State Superintendent of Public Instruction, state board of education and the Commissioner of Agriculture are to be appointed by the Governor, the legislature being free to abolish the single executives after the expiration of the terms of those elected this year. That leaves the attorney-general and lieutenant governor elected by the people and the auditor of public accounts selected by joint vote of the two houses of the General Assembly—the only officials independent of the governor, except the State Corporation Commission, which is to be selected by the General Assembly instead of appointed by the Governor as formerly.

The trend of the new articles is to eliminate the old detailed restrictions and to leave more to the discretion of the legislature. The salary of the governor and of judges is no longer specified. The detailed provisions concerning the prison, penitentiary and state hospitals are repealed. County consolidation and optional forms of county government are authorized. The possibility of having a unicameral council is extended to first class cities hitherto excluded. Provision for justices of the peace is left optional instead of mandatory.

New Tax Provisions.—One change of major importance is the provision that no state property tax for state purposes shall be levied on real estate or tangible personal property except rolling stock of public service corporations, which are assessed by the State Corporation Commission. The legislature is given more specific auhtority to classify and segregate objects of taxation. While restrictions on the borrowing power of counties and districts are added, with popular vote a prerequisite, the old rigid limitation on state indebtedness is removed and a debt for a single purpose constituting new capital outlay may now be incurred after popular vote up to one per cent of the assessed value of real property in the state. Several minor provisions are of interest, such as: the residence requirement for voting, dropped from two years to one in the state; no residence qualification for appointment to offices requiring technical nor professional training.

OTHER STATES

Florida, long an offender in the field of special legislation, provided for classification of cities and prohibited special laws for their incorporation, with restrictions for other special and local laws.

Kansas, hampered in its road development and in danger of losing Federal aid because of the old prohibition against internal improvements by the state, adopted a new provision which insures a state highway system.

Rhode Island.—The senatorial problem, acute since 1925, was reme-

died, not by abolishing the "rotten boroughs" but by adding representation for the cities on a rough population basis. The property qualification for voting was also partially removed, remaining now solely for financial town meetings.

FINANCIAL CHANGES

Bond issues totaling $470,000,000 were before the people in seven states in thirteen amendments. Four of these, involving $117,000,000, were adopted; California, $1,000,000 for the Olympiad in California in 1932 and $6,000,000 for state parks; Missouri, $75,000,000 and West Virginia, $35,000,000, state highway bonds. Those defeated were: Alabama, $20,000,000, school buildings; California, $10,000,000, elimination of grade crossings on state highways; Colorado, $60,000,000, six-year road program; North Dakota, $25,000,000 to pay deposits in insolvent state banks; and Pennsylvania, $8,000,000 for Pennsylvania State College buildings, $25,000,000 for purchase of land for forest purposes, $5,000,000 for buildings for the national guard, $50,000,000 for buildings for the penal, delinquent and other state institutions, and finally the raising of the total for state highway bonds to $150,000,000.

Legislator's Pay.—Proper readjustment of compensation of state legislators continues to make slow progress. Of nine such proposals, three were adopted;—Arkansas, $1,000 salary plus $6 *per diem* for extra session; Michigan, change from $800 salary and $5 *per diem* for twenty-day special session to $3 *per diem* for the term for which elected; North Carolina, $600 salary instead of $4 for 60 days. Those defeated were: Florida, increase from $6 to $12.50 *per diem;* Idaho, from $5 to $10, with maximum changed to $600; Maryland, *per diem* of $15, Missouri, New Mexico and North Dakota.

Official Salaries.—The tendency to remove detailed provision from the constitution and to leave salaries to the legislature was successful in Colorado for the governor, governor's secretary, and for supreme and district court judges, and in Georgia for prosecuting attorneys and for the secretary of state, comptroller general and state treasurer, but the latter authorizing the legislature to prescribe the duties and authority of these offices as well. Georgia also increased circuit judges salaries from $3,000 to $5,000. Increase for judges was defeated in Ohio. Arkansas increased salaries of state and district officers, raising the Governor's salary to $6,000. Terms of state officers were raised from two to four years in Idaho, but a similar provision was defeated in New Mexico, as was the attempt to have county officers elected in odd years.

Taxes.—Changes in tax provisions were few. In Indiana the income tax, with a popular vote of 27,000 in its favor, failed by nearly 280,000 of having the constitutional majority required. Classification of property was defeated in North Carolina and Washington. Pennsylvania authorized exemptions in the inheritance tax and California provided a four per cent net income tax on banks, business and industrial corporations in lieu of taxes on shares or franchises, with an exemption up to nine-tenths of the personal property tax. The gasoline tax was validated in Kansas and Louisiana sanctioned a tax on all gasoline sold in the state, with another amendment distributing the receipts from a four per cent tax and relieving localities from all charges for state highways. Minnesota likewise provided for distribution of the receipts between two state funds.

COURT REORGANIZATION

Excess condemnation was approved in California and Michigan, but was defeated in Colorado. The courts received attention in California where an amendment to eight sections was adopted, authorizing considerable reorganization of the court system and particularly ratifying legislation fixing the exclusive jurisdiction of municipal courts. California also dropped the $3 fee for jurors, permitting the legislature to increase the amount, and provided for the waiving of jury trial in criminal cases. Arkansas provided for verdict by nine of the

twelve jurors in civil cases. In Georgia the legislature was authorized to provide other courts in lieu of justices of the peace.

CONSERVATION

In the field of conservation Idaho authorized state regulation and limitation of use of water for power purposes and California prohibited wasteful or unreasonable use of water. Louisiana authorized navigation and river districts in addition to levee districts and created the Pontchartrain Sanitary District within the Orleans Levee District. New Mexico authorized contracts for the development and production of minerals on state lands. North Dakota transferred assessment of light, heat and power, and transportation companies to the state board of equalization, possible as much as a conservation as a tax measure.

MUNICIPAL AND LOCAL AMENDMENTS

In the municipal field the chief item was the extension in Georgia of zoning and city planning authority to cities over 25,000 population, and the excess condemnation provisions above mentioned. The Indiana proposal authorizing classification of counties, cities and towns for registration laws failed to carry, but Pennsylvania adopted a provision restricting registration to cities. In minor amendments particular communities continued to seek an increase in their debt limit. The most important this year was Philadelphia which was denied the change from ten to fourteen per cent.

Most of the other amendments were essentially local though it is of interest to note the increasing permission in the south for localities to encourage industries by exempting them from taxation for a period of years. Of more popular interest perhaps was the defeat in June, by 103,696 to 96,837, of the proposal to repeal the North Dakota section on prohibition. In all, 153 amendments were proposed and 107 adopted. South Carolina headed the list of states with 23 proposals, followed by California with 19, Louisiana with 18, and Pennsylvania with 14.

CHANGES IN ELECTORAL LAWS

By Charles Kettleborough

Director, Indiana Legislative Bureau

VOTERS

Registration or Enrollment.—Detailed changes of minor importance were made in the registration or enrollment laws of Alabama, Delaware, Florida, Illinois, Kentucky, Louisiana, Pennsylvania, South Carolina and Virginia. The changes so made relate to the character of the oath administered to registrants, the filing of the registration blanks, providing for registration of voters who move from one county to another, the disposition of records of the registration units, adjustments in time and hours during which voters may register and during which lists are purged, authorizing a voter to designate his age as 21 years or over, designating certain public officials as registration officials, designating counties and cities to which registration shall apply, and fixing the places of registration. In Florida, one of the questions which an applicant for registration in counties having a population of more than 150,000 is required to answer is whether he is a freeholder; and in all parishes in Louisiana, except Orleans, the registration officers are required to give each registrant a registration certificate.

Absent Voters.—Florida enacted an entire absent voters law which applies to all elections and to all voters who are absent from the county, and Virginia made a few unimportant procedural changes in the existing law.

ELECTIONS

Expenditures.—Pennsylvania authorizes the expenditure of money for

the rental of radio facilities for use in elections. The schedule of the amounts of money authorized to be spent in primaries in Florida was practically doubled. The amounts spent in elections in Kentucky were readjusted on a higher scale than formerly. The character of the report of amounts spent by candidates in Virginia was prescribed.

Nominations.—Only slight amendments were made in the laws providing for the nomination of candidates. Pennsylvania and Florida changed the time of filing nomination papers of certain officers. Illinois made minor changes in the law regulating nominations by minor parties, not affected by the primary. Rhode Island amended the law providing for the holding of political caucuses in certain cities of the state.

Primaries.—No notable changes were made in any of the primary laws, but amendments of a minor character were made in Alabama, Delaware, Illinois, New Jersey and Mississippi. The amendments made relate to the preparation of the registration lists for the primary; prescribing the penalty for voting or attempting to vote more than once at a primary; prescribing the order in which the names shall appear on the primary ballot; and the time when the names of candidates in the primary shall be furnished to the proper authorities.

General Elections. — While no marked changes were made in the general election laws of any of the states, detailed adjustments to improve the workability of the laws were made in 10 states. These changes relate to the form of the ballot, compensation of members of election boards and watchers, furnishing of aid to blind or disabled voters, appointment of election boards, selection or designation of polling places, certification of the names of delegates to the National Convention, character of ballot boxes and disposition and care of ballots after an election, and printing of ballots. Pennsylvania provides for the recount of ballots in any election unit in which fraud may have been perpetrated, and provides also that when any voter is given assistance in marking his ballot, a record must be kept of the voters assisted, why they were assisted, and the person who gave the assistance. Alabama provides that where two or more judges of the supreme court, the court of appeals, the circuit court and the public service commission are to be nominated or elected, each place to be filled is designated by a number according to the seniority in service of the incumbent, or, if the seniority cannot be indicated, the names are set out in alphabetical order. Illinois permits women to serve on election boards in cities, towns and villages. South Carolina provides a method of placing constitutional amendments on the ballot when they are state-wide in their nature or restricted in their operation to one or more localities.

STATE LEGISLATURES AND LEGISLATION

By John M. Mathews

Professor, University of Illinois

The Lobby Problem.—A perennial problem in state legislative sessions is how to deal with the lobby. That this problem is far from being solved is indicated by the message of Governor Sampson of Kentucky in which he denounced the greed and selfishness of the subsidized lobby during legislative sessions as a menace to free government and declared it to be "the darkest blot upon the fair name of Kentucky."

Gov. Smith's Legislative Proposals.—Governor Smith of New York recommended that the Legislature should not waste time on detailed legislation regarding matters which could be better regulated by rules issued by the executive departments. He also recommended that the terms of state sena-

tors and assemblymen should be increased to four and two years, respectively. He further recommended the adoption of a constitutional amendment prohibiting all legislation in even years except appropriation bills, unless specifically requested by the governor.

Congressional Apportionment.—In some of the states, the Legislatures have been dilatory about carrying out the constitutional mandate to reapportion representatives on the basis of the latest census. Thus, Illinois has not been reapportioned since 1901. Until recently, the situation in California was similar. In that State more than half of the total population is concentrated in three of the fifty-eight counties. Two years ago the people by initiative petition instructed the legislature to adopt the "Federal plan" of apportionment whereby representation in the lower house should be based on population but in the Senate the counties should have almost equal representation. The legislature in 1927 passed an act to this effect, but upon it the popular referendum was invoked. Finally, after various delays, the referendum was held at the November, 1928, election and the measure was eventually approved.

STATE EXECUTIVES AND DEPARTMENTS

By John M. Mathews

Professor, University of Illinois

Annual Conference of Governors.—The annual conference of state governors was held in New Orleans in November. Among the topics discussed were the relations of government and business, state taxation of national banks, gambling on the stock and produce exchanges, and President-elect Hoover's plan of stabilizing employment by means of a three billion dollar fund to be employed on construction work in slack times.

Procedure in Capital Cases.—As a repercussion of the Sacco-Vanzetti case, Governor Fuller of Massachusetts, in his annual message to the legislature, recommended that that body should give consideration to the matters of appeals, exceptions, and motions for new trials in capital cases. His expressed motive was to relieve future governors of the "difficulties which were forced upon him in 1927 by zealous defenders of persons convicted of first degree murder." He endorsed the proposal for procedural remedy contained in a recent report of the state judicial council (outlined in the American Year Book for 1927, p. 111).

Governorship Term.—In a number of states the governor's term of office is only two years, but there is a widespread feeling that it should be increased to four years. At the time that the Ohio administrative code was adopted in 1921, reorganizing the administration of that State, it was recognized that the plan was defective in that the governor's term remained at two years. In 1928 the State Committee of the Citizens' League of Cleveland made a report pointing out this and other defects and recommending that, for the sake of continuity in administration, the governor should be given a longer term of office. This *desideratum* would also be promoted by the appointment of advisory boards and by the building up of a trained and permanent civil service below the department heads. The adoption of these suggestions would not entail the loss of the important principle of executive authority and responsibility.

Smith on Gubernatorial Election.—New York is another State in which the governor's term is only two years. Governor Smith of that state has long advocated the adoption of a constitutional amendment extending the term to four years, and providing that the election should occur at some time other than the date of the presidential election, in order to avoid

the confusion of state and national issues. The legislature submitted such an amendment to the voters, except that it provided that the gubernatorial and presidential elections should be held in the same year. Governor Smith contended that this vitiated the whole plan and urged the voters of the state to defeat the proposal, and they accordingly did as he wished.

Governor's Term in New York.—In his message to the legislature of 1928, Governor Smith recommended the resubmission to the voters of the amendment extending the governor's term to four years, but with the election in other than presidential years. His successor, Governor Roosevelt, is also in favor of this plan and is quoted as saying that it is the most important piece of unfinished business in connection with the reorganization of the State government. In its State platform, adopted at Rochester in October, the Democratic party pledged itself to carry out this project. The party also pledged itself to "establish a new constitutional executive budget, so as to carry out the spirit and intent of the amendment" which became effective on Jan. 1, 1929.

STATE ADMINISTRATION AND JUDICIARY

By John M. Mathews

Professor, University of Illinois

STATE ADMINISTRATION

The State in Industry.—The cost of running the state governments and the amount of their total indebtedness continues to increase, according to figures released by the Department of Commerce in 1928. The operation of the state mill and grain elevator in North Dakota seemed to encounter some difficulty. Governor Sorlie of that State, in his message to the Legislature convened in special session, outlined the problems facing the state industry and made certain recommendations designed to place it on a plane of equality in competition with private industry. As shown by a report issued by Governor Smith of New York in October, that State is engaged in the largest building program in its history. This program includes not only state buildings but also highways, bridges, grade crossing elimination, canal work, and park development.

Reorganization in Minnesota.—The Administrative Reorganization Act of Minnesota passed in 1925 was weakened by a recent decision of the supreme court of that State holding that the Legislature did not have authority to delegate to the State commission on administration and finance supervision over the expenditures of the board of regents of the State university. The decision was based on the idea that the university was endowed with certain immunities derived from the constitution. The significance of the decision is that the same principle of immunity from central financial control may be extended to the expenditures of various constitutional officers, such as the secretary of state and attorney general, and thus bring about serious disintegration in the State administration.

In Virginia, far-reaching reform in the State administrative organization has recently taken place. This was brought about in part by the Legislature at its sessions of 1927 and 1928. The State government, as thus reorganized, besides the governor's office, consists of twelve departments, as follows: finance, taxation, corporations, highways, conservation and development, health, public welfare, education, agriculture, law, labor and industry, and workmen's compensation. About thirty boards and other agencies were abolished. The legislative enactments provided that the governor should appoint the heads of all the twelve departments except three, viz., the commissioner of agriculture, the superintendent of public instruc-

tion, and the state treasurer. These three officers could not be made appointive without amending the constitution. Consequently, in June, 1928, the voters by an overwhelming majority adopted an amendment providing that until 1932 these three officers shall be appointive rather than elective, and that thereafter the General Assembly may provide the method of selection. Although the attorney-general is still an elective officer, the changes already made virtually establish the short ballot principle and greatly promote the integration and efficiency of the State administration.

THE STATE JUDICIARY

Judicial Councils.—Eleven states have now established judicial councils, the latest being that authorized in 1928 in Virginia. The council in that State is based in the main on the Federal model and consists of the president of the supreme court of appeals and such other judges as he selects from year to year, together with a number of lawyers. Unlike the Federal council and that of California, the Virginia Council does not have the power of transferring judges. In fact its powers are those of advice and recommendation only. The efficacy of judicial councils varies considerably from state to state. Sometimes, unfortunately, little interest in council meetings is taken by the judges themselves. In some states, however, useful changes and reforms have been accomplished. Especially noteworthy has been the work of the Massachusetts and California councils. The former body has made valuable suggestions for legislation, while the latter has made good progress in unifying the judicial work of the State. No judicial council has as yet been granted any law-making power. In Washington, however, the council has formulated rules which have subsequently been adopted by the state supreme court, an advance in the unification of judicial work.

COUNTY AND RURAL GOVERNMENT

By Orren C. Hormell

Professor, Bowdoin College

REFORM MOVEMENTS

Significant Experiments.—County government continued, in 1928, to be "the most conspicuous failure in American Democracy." Although no general or nation-wide movement for reform in county and rural government can be detected, significant experiments in a few states deserve special attention as indicating tendencies or blazing the trail for more general reform in county and rural government. Among such experiments, the following are some of the more important: (1) reorganization in county government; (2) county and county-city consolidation; (3) county and regional planning; (4) fiscal reform.

REORGANIZATION OF COUNTY GOVERNMENT

New York.—Governor Smith in a message to the legislature January 4th, again (see American Year Book, 1926, p. 190) recommended the creation of a special commission to make "a thorough study of county government looking to consolidation as well as to reform in the form of county government, to bring about better administration and benefits similar to those which the state is reaping from its own consolidation of departments." His recommendation, however, had no effect upon the legislature in the face of organized opposition of local authorities and party committees.

Westchester County.—(See American Year Book, 1925, p. 174; 1926, p. 190; and 1927, p. 113). Westchester again failed to make positive headway toward the adoption of a satisfactory reform charter. The Home Rule Association of Westchester County proposed to the legislature a constitutional amendment providing

in substance that "all offices and functions of Westchester County except the judiciary should be included in any charter adopted, and that after it was adopted the charter could not be amended except by the vote of the people." Such a provision, its proponents believed, would remove the opposition which had defeated the reform charter at the polls. The failure of the legislature to adopt the amendment, it is claimed by the Home Rule Association, was occasioned by the opposition of the Westchester County Republican Committee.

South Carolina.—The legislature of South Carolina passed several special acts relating to county government, some of which tended to simplify the government. The position of county supervisor was abolished in Lee County and in Saluda County, and the powers vested in the board of county commissioners, while in Fairfield County the board of county commissioners was abolished and the powers vested in the county supervisor.

Virginia.—A constitutional amendment adopted by the voters of Virginia June 19, 1928, makes possible the reform of county government in that state whenever it is possible to overcome the influence of county rings and local office-holders now strongly intrenched in political party organization. The essential provision of the amendment is: "The general assembly may by general law provide for complete forms of county organization and government . . . to become effective in any county when submitted to the qualified voters thereof in any election held for such purpose and approved by a majority of those voting thereon."

This amendment makes possible the reform of the county government along the lines suggested in the excellent report on county government to the Governor of Virginia, prepared by the New York Bureau of Municipal Research, January, 1927. The report is one of the outstanding contributions to county government in the United States. County government is characterized as being "scattered, disjointed and irresponsible." In many counties the investigators consider operation of the government to be "grossly political, careless, wasteful and thoroughly inefficient," while "the voters of the county have very little power in the determination of county policies."

The plan proposed for reform includes the abolition of many offices and boards and the coordination of the remaining administrative offices under the control of an administrative head to be called a "county administrator" elected by the people, or a "county manager" appointed by the county board of supervisors.

COUNTY AND COUNTY-CITY CONSOLIDATION

Tennessee.—An interesting experiment in county consolidation is being considered in Tennessee (see *National Municipal Review*, September, 1928, pp. 511-514), where the financial saving resulting from the consolidation of Hamilton and James Counties in 1919 has been so marked that A. P. Childress, state tax superintendent, has proposed that the ninety-five counties be consolidated into eleven units, each grouped around a town of some importance near the geographical center. The opinion is growing that modern means of communication and transportation have made a county seat every few miles "a senseless incumbrance upon the public purse." The same opposition is appearing in Tennessee, however, which so far has blocked the attempts of the Governor of New York to bring about general county consolidation.

San Francisco-San Mateo Survey.—The San Francisco Bureau of Governmental Research prepared for the San Francisco Chamber of Commerce a most exhaustive survey of the several units of government in San Francisco city and county, and San Mateo County, accompanied by a satisfactory plan for the consolidation of San Mateo County with the city-county government of San Francisco. The Bureau recommends "that the two areas cooperate in a plan of consolidation as a city-county with adequate provisions for local representa-

tion on a central legislative body, a centralized administration of common governmental functions, and the retention of local powers and control of local functions by local units, or boroughs."

Ohio.—A citizens' regional government committee appointed by the Mayor of Cleveland has undertaken the survey of the several units of government in Cuyahoga County, with the purpose of devising a workable system of regional or metropolitan government.

REGIONAL PLANNING

New Jersey.—Noteworthy advances in regional planning were made in several states. The Bergen County Chamber of Commerce created a county planning commission which has been intrusted with the task of drawing up plans for the logical and scientific development of the county as a whole, including sixty-nine municipalities. At present the activities of the commission are being centered upon sewage disposal and sanitation, and a county park system.

Pennsylvania.—The planning commissions of the boroughs of Camp Hill and New Cumberland in Cumberland County, Pennsylvania, joined to solve their common problems of sanitary sewage and street extension.

Georgia.—Glynn County is working out a regional planning scheme for the city of Brunswick and the numerous small villages in the county with the object of attaining the orderly development of the present advantages within reasonable zoning restrictions; directing the industrial and agricultural development of the county, and providing for parks and circulating boulevards.

New York. — The Westchester County Park Commission continued during the year its constructive public welfare program by developing a $47,000,000 park project centering in a recreational amusement park at Rye Beach. The development is financed by long term bonds to be paid off, it is expected, out of earnings. They also have undertaken the building of a $600,000 "county center" at White Plains, consisting of an auditorium for the use of organizations holding county-wide gatherings.

FISCAL REFORM

California.—The County Budget Act of 1927 (see AMERICAN YEAR BOOK, 1927, p. 112) resulted in a marked improvement in the classification and organization of budget estimates, judging from the printed budget for 1928-29 published by the County of Los Angeles.

Michigan.—The voters of Wayne County on November 6, by a vote of 184,378 "for" and 174,734 "against," adopted a long term pay-as-you-go building program. Beginning with 1929, buildings as well as roads and parks will be financed on the pay-as-you-go basis.

New Jersey.—The legislature of New Jersey (*Laws*, 1928, Chap. 184) authorized counties of the first and second class to issue serial bonds (20 years limit) for the financing of airports.

Virginia.—An excellent plan for fiscal reform in county government is presented in the report of the New York Bureau of Municipal Research to the Governor of Virginia. The essential points in the proposed reform may be summarized as follows: establish a central accounting system in each county under a controller responsible to the chief administrative officer; adopt uniform budget forms and classification; establish a uniform fiscal year for all counties; abandon the fee system; provide for centralized purchasing under the chief administrative officer, and make the treasurer responsible for the custody of all county funds.

COGNATE SOCIETIES

AMERICAN CONSTITUTIONAL LEAGUE,—27 William St., New York, N. Y.

AMERICAN DEFENSE SOCIETY, INC.—154 Nassau St., New York, N. Y.

CIVIL SERVICE FORUM.—1756 46th St., Brooklyn, N. Y.

NATIONAL ASSOCIATION FOR CONSTITUTIONAL GOVERNMENT.—716 Colorado Bldg., Washington, D. C.

NATIONAL CIVIL SERVICE REFORM LEAGUE.—8 W. 40th St., New York, N. Y.

NATIONAL STATE ASSOCIATION.—644 Drexel Bldg., Philadelphia, Pa.

VOTERS' EDUCATIONAL LEAGUE.—524 First Ave., New York, N. Y.

DIVISION V

MUNICIPAL GOVERNMENT

CITY POLITICS

By Clinton Rogers Woodruff
Honorary Secretary, National Municipal League

CHICAGO

Defeat of Mayor Thompson.—William Hale Thompson was elected Mayor in 1927 along with his whole ticket. After a campaign of buffoonery and demagogy, one year later in April, 1928, in what was called "the greatest political upheaval in the history of Illinois," the Republican machine headed by Mayor Thompson, State's Attorney Crowe, and Governor "Len" Small was overwhelmingly defeated. So strong was this alliance that, as the primary election returns came in, editors found themselves using such words as "revolution," "amazing," "miracle." It was an epic of American politics, wrote a *New York Evening Post* correspondent from Chicago, that the voters should have arisen to smite a machine which had such concentrated power in money, patronage, and organization. The climax of the bomb-throwing, which had an important influence on the voting according to all accounts, was the explosions on March 26 in the homes of Senator Deneen, the anti-Thompson leader, and of Judge Swanson, his candidate for State's Attorney. On the day of the voting no bombs were thrown, but there were various acts of violence.

Effect of the Election.—The sound of the uprising reverberated far and wide, calling forth leading editorials in London dailies whose readers had for months been regaled with stories of Thompson's attacks on King George as their chief staple of American political news. Most important was the moral effect upon officeholders and voters alike. Plain physical courage was demanded of the candidates opposing the existing order in Chicago. Seldom had a less inviting task confronted honest citizens than charging the intrenched powers of the local government. The overwhelming victory was regarded as a tribute both to the bravery of the opposition and the underlying good sense of the voters of Chicago.

PHILADELPHIA

Police Investigation.—Philadelphia has been the scene of a widespread grand jury investigation into police methods, that has resulted in the removal of a score of the higher officials in the Police Bureau. The investigation grew out of the murder of two prominent figures in the underworld. Judge Edwin O. Lewis, sitting in a criminal court, charged the August Grand Jury to investigate the situation, which it did under the direction of the District Attorney, a former Judge Monaghan. A ward leader has been convicted and sent to jail along with a police captain, and numerous other trials are pending. The connection of the police and gambling and bootlegging has been abundantly proved and to a measurable extent punished.

NEW YORK

Queens Sewer Scandal.—Michael E. Connolly is the fourth borough head since the establishment of Greater New York to be called formally to account for his official conduct by the Governor of the State.

Following investigations of formal charges, Governor Hughes removed President John F. Ahern of Manhattan and Louis F. Haffen of The Bronx. Governor Dix ousted Lawrence Gresser, who preceded Connolly as the head of Queens Borough. Gresser's predecessor, Joseph Bermel, was also under fire and Governor Hughes was considering action in his case when Bermel fled to Europe. The recent crisis in Queens has revived the ever contentious subject of borough autonomy. Many view the facts already developed concerning procedure in the preparation of specifications, plans and contracts as indicating conclusively the need for a centralized engineering administration of all public improvements throughout the City, with uniform standards and methods and a single administrative policy.

Prosecution of Connolly. — The charges against Borough President Connolly were presented to Governor Smith by "Flushing's Fighting Alderman," George U. Harvey, who was reelected to the Board in November, 1927. He was an unsuccessful candidate for President of the Board of Alderman in 1925, but was elected in November, 1928. The framing of formal charges against the borough head came as a culmination of public hearings before the City's Board of Assessors on application of Queens taxpayers for a revision of assessments in connection with the new sewer system which had been under way for several years. Henry H. Klein presented the case on behalf of the taxpayers and the charges were based very largely on the testimony of employees in Connolly's own office. The Governor acted quickly, designating Supreme Court Justice Townsend Scudder to conduct the investigation. Former Federal District Attorney Emory R. Buckner prepared the case for the State and successfully prosecuted the charges against the Borough President.

Connolly came into office sixteen years ago when Governor Dix ejected Gresser. He has dominated the Queens situation quite consistently ever since, although his leadership has often been challenged. He built up a powerful political machine which at times was in open conflict with Tammany Hall.

SEATTLE

Mayor Landes's Record.—Four years ago Mrs. Bertha Knight Landes, wife of Dean Landes of the University of Washington and sister-in-law of David Starr Jordan, was chosen to an unexpired term as mayor of Seattle. She was subsequently elected for a full term by a majority of 5,000. In the judgment of many students Mrs. Landes was the best mayor Seattle had had in a generation, her dominating characteristic being strong common sense. She developed into an effective speaker and had timely messages for each occasion and her administration was one of political peace. Her appointments were good and the whole administration was conducted upon a high standard. Her Chief of Police was a man with a clean record who believed in the enforcement of the laws.

Election of Edwards.—She came up for reëlection in 1928, her opponent being Frank Edwards, formerly the owner of a moving picture theater, who had had little municipal or public service experience. He made a quiet, discreet campaign and had the support of elements not usually favorable to strict enforcement of the laws. While the real issue was between effectiveness and mediocrity, personal issues and inclinations carried the day and Mr. Edwards was elected by a substantial majority. His appointments since his election and his conduct generally has been such as to justify the criticism that Mrs. Landes made of his candidacy, but which reacted against her. The situation is another chapter in that curious shifting back and forth which has characterized many elections in all parts of the country.

INDIANAPOLIS

Mayor L. Ert Slack has made a complete revolution in the city government. From one of the worst any city ever had (see AMERICAN YEAR BOOK, 1927) he has made it one of the best. Competent observers hold

that although it now lacks the merit system, they look for that to come with the approaching city manager plan which goes into effect in 1930.

READING

The socialistic government here is like every other government, no better, no worse. Theories are one thing, but the putting those theories into actual execution is entirely another, and the Socialists found that they could not put their pet projects into operation on account of existing legislation. Since going into office they have had the courage to procure a new City Hall, which was much needed, by purchasing the old Boys High School and remodeling it in such a way as to make it suitable for offices. The Socialists have discovered that a government cannot be run and improvements made without money. To secure sufficient funds, assessments have been raised all over the city. This has created quite a furore. On account of objections made by property owners, many of those assessments had to be readjusted. The present régime is going along much as another administration. It gets criticism from some quarters, but on the whole it is doing very good work.

ADMINISTRATION AND RESEARCH

By Clinton Rogers Woodruff

Honorary Secretary, National Municipal League

CITY BUDGET PROSPERITY

Salary Adjustment.—According to Dr. Luther Gulick, Director of the National Institute of Public Administration, 1928 was notable in the annals of American municipal history for two things. It was a year of unexampled city-budget prosperity. Our American cities, as a whole, he believes, have entered upon a new and higher standard of government service and expenditure. The grave injustice which was done to public employees by the failure of salaries to keep pace with the cost of living has been righted in most cities and it may be said that city rates of pay are now more favorable to the city's servants than they were before the war. In New York City, salary schedules did not catch up with the cost of living until 1927 and 1928.

Introduction of labor-saving machinery is another indication of city prosperity. The motorized equipment of public works departments, with ditch diggers, catch-basin pumps, scarrifiers, graders, pumps, tractors, trailers, rollers, pavers, mixers, power shovels, mechanical street cleaners and snow removers are paralleled in intricacy if not in mass by the computing, accounting and tabulating machinery which has been brought into the municipal service. In New York City in 1906 there was one city employee for 59 people in the city; in 1926 there was one city servant for 52 people; and in 1928 there was one servant for 50 people. This represents roughly an increase of 15 per cent in 22 years in the standard of service rendered by New York's local government to its citizens.

Expenditure Record.—The natural resources, creative ingenuity and productive energies that have made possible our tremendous city expenditures for streets, sewers, schools, bridges, water supply, civic centers, libraries, museums, parks, boulevards, transportation systems, elimination of grade crossing, street widenings, traffic control, slum clearance, harbor development and air ports and the great pressure of the needs which have called forth these improvements have placed before our cities an unexampled temptation to extravagance.

Gulick Report Denies Waste.—Nevertheless, the cities cannot be charged with lavish waste, Dr. Gulick declared in his annual report to the Institute. "With very few exceptions, the things built were needed long before they were completed. It

is easy to make sweeping charges of extravagance; it is not so easy to name the street that should not have been paved, the bridge that should not have been erected, the school that is superfluous. If we are to judge by useless structures, city authorities have shown far more sagacity than have business men. For every folly of public construction one can show a score of private follies. The true extravagance in public works has come not from engaging in unnecessary projects, but from unnecessarily high standards, from faulty planning, from relying upon inexperienced advice, from bad business methods, and from dealing with corrupt contractors and officials. For example, in Duluth, a few years ago, approximately one million dollars of unnecessary expenditure was eliminated from the plans of the new city hall as the result of a study of space requirements and the inauguration of an architectural competition initiated by the Taxpayers' League of St. Louis County. Similarly, in St. Paul, the Bureau of Municipal Research, through better planning and design brought about an even larger reduction in the school building program. In both cases the improvements were needed. The danger of extravagance appeared not in the project itself, but in the unnecessarily luxurious method of going about the work. This is an enhanced danger for cities, as for individuals, during a period of unexampled financial prosperity."

MUNICIPAL CORRUPTION

A notable feature of 1928 has been the disclosure of widespread, extensive and shameless corruption in some departments of certain city governments. For the last decade we have taken pride in the thought that "the shame of the cities" was past. Now we are brought up with a sharp jerk by conditions disclosed in Chicago, Philadelphia and New York. We are treated to the spectacle of organized vice protection; of high police officers and their subordinates drawing regular pay from bootleggers and speakeasies; of so-called experts hired by the city at tremendous compensation to perform no service except to divert the fees into the coffers of the powers that be; of sewer contracts so drawn and so manipulated that the taxpayers have been forced to pay as much as $45 per foot for $3.02 pipe apparently for the benefit of a ring of politicians, technical employees, and business statesmen, who appear to have taken $10,000,000 in ten years on contracts totaling less than $30,000,000. These aired cases of corruption and the dishonesty which is continually disclosed in connection with building inspection, tenement inspection, health inspection and at other points where individual inspectors have the power to apply or temper laws or regulations affecting the property or business of individuals, prove that the task of purifying city administration has only just begun.

FINANCIAL PLANNING AND MUNICIPAL REORGANIZATION

There is no more important activity being initiated by our cities than the effort to develop and put into effect long time financial planning. This is nothing more nor less than an application of budget psychology to community planning. The cities which deserve special mention for the progress they have made in this field are Detroit; Trenton, N. J.; Dallas, Texas; and Schenectady and White Plains, New York. In two of these the local bureaus are intimately involved in the development of the plans.

In the field of municipal reorganization, probably the most important work has been done in Rochester and Cincinnati where two excellent city managers have been at work. In both cities, it is difficult to overestimate the service which has been rendered by the local bureaus of research.

ADMINISTRATIVE RESEARCH

Study of Criminal Statistics.—The most important piece of research work in administration undertaken during the year is the study of criminal statistics and reporting which is being made by a committee of the International Association of Chiefs of Police, of which Chief Rutledge of Detroit is chairman. Lent D. Upson

is chairman of the advisory committee and Bruce Smith, the director of study. Fifty thousand dollars has been made available for the project.

New York Water Power Survey.—A research study deserving of note also, is the survey of water power in New York State undertaken by Dr. William E. Mosher and his associates of the Syracuse School of Citizenship and Public Affairs.

Government Study in Jugoslavia.—Dr. Charles A. Beard's first-hand study of national and local government in Jugoslavia, under the auspices of the National Institute of Public Administration and the American Jugoslav Society, will serve to throw a new light on complex problems to enrich our knowledge of comparative government, and to plant the seeds of government research in another section of the world.

Tax Research Fellowships.—The Tax Department of the State of New York has created four research fellowships and has appointed four graduate students for the current year to make special studies of problems of taxation and tax administration. This is an important and promising adventure. The committee on municipal standards is also a distinct forward step.

Public Service Training.—The cause of training for public service has made a notable advance through the development of cooperative police training schools for the cities of the State of New York for which the New York State Conference of Mayors was responsible. Professor Lowrie's program for the training of municipal executives in Cincinnati through a combination of university and practical work in the city departments deserves special mention.

New Research Bureaus.—During the year three new bureaus of government research have been established; the Erie County Taxpayers' Association, the Schenectady Bureau of Municipal Research, and the Sioux City Bureau of Municipal Research. The new Municipal Reference Bureau of the University of Cincinnati also deserves mention.

It is difficult to select the most conspicuous work carried on by a local bureau of municipal research during the past year. Probably the largest achievement in any city has been recorded in Buffalo, where the newly organized bureau is credited with having saved the city some $3,000,000 through its recommendations, and where its many constructive suggestions have won for the bureau a recognized position of leadership in many civic enterprises. The joint committee on real estate valuation in Chicago has also made an enviable record.

Brookings Institution.—Perhaps the most important event of the year in organized research is the establishment and endowment of the Brookings Institution in Washington, of which the Institute for Government Research is a part, thus becoming the first large-scale endowed governmental research agency on this continent.

CITY MANAGER GOVERNMENT

By Clinton Rogers Woodruff

Honorary Secretary, National Municipal League

New Adoptions of City Manager Plan.—The council-manager plan of city government has continued its steady growth during 1928, when sixteen cities adopted the plan by charter and six cities by ordinance. Those cities that adopted it by charter were: Albert Lea, Minn.; Beloit, Wis.; Brattleboro, Vt.; Dearborn, Mich.; Gainesville, Texas; Flint, Mich.; Goose Creek, Texas; Ironton, Ohio; Pampa, Texas; Stevens Point, Wis.; Sweetwater, Texas; Wichita Falls, Texas; Covington, Lexington and Owensboro, Ky., and Fall River, Mass. By Ordinance: Coronado, Cal.; Ellwood City and Hanover, Penn.; Hillsborough (San Mateo), Cal.; San Leandro, Cal.; Shorewood (Milwaukee), Wis.

Rejections of Plan by Vote.—During 1928 two cities, Tampa, Florida, and Albion, Mich., abandoned the city manager plan by vote of the people. This makes a total of seven cities in the history of the council-manager plan of government abandoned by a vote of the people. They are in the order of their abandonment: Waltham, Mass.; Lawton, Okla.; Akron, Ohio; Collinsville, Okla.; Santa Barbara, Cal.; Tampa, Fla.; Albion, Mich. Five city councils rescinded their city-manager plan ordinances: Coronado, Cal. (which rescinded its ordinance in Dec., 1927, but passed another city manager plan ordinance in August, 1928); Wilmette, Ill.; West Aurora, N. Y.; Hollidaysburg, Penn., and Highland Park, Texas. In Toledo, Ohio, a charter proposal embodying the city manager form with proportional representation was defeated. An effort to repeal the city manager charter in Cleveland was defeated April 24 by a vote 43,798 to 41,035.

Operation of Plan by States.—There are now thirty-five states that have cities operating under this plan of government, while the following thirteen states—Alabama, Delaware, Nevada, Washington, North Dakota, Louisiana, Kentucky, Idaho, Maryland, New Hampshire, Rhode Island, Wyoming, Mississippi—do not have recognized city manager cities. Michigan leads all other states in the number of city manager cities with forty-two; Florida has thirty-nine; California, thirty-three; Texas, thirty-one; Virginia, twenty-four, and Oklahoma, twenty-three. It is interesting to note that five of the eleven charter cities enrolled in the city manager field last year are Texas cities. Municipal progress is much in evidence in that state.

Net Gain for Plan.—With the seventeen new council-manager cities and the seven cities dropped there is a net gain of ten cities for the year, which gives a total of three hundred and ninety cities operating under or pledged to the council-manager plan of government, as of Sept. 1, 1928. Kenosha, Wis., voted down an attempt to force the abandonment of the council-manager form, which it has had in effect for six years.

City Manager Appointments and Promotions.—Eighty city managers were appointed during the period Sept. 1, 1927, to Aug. 31, 1928. Of these, fifty-eight were new men in the profession. There were twenty-two promotions during the year. Thirteen members of the City Managers Association reentered the profession, while nine were promoted from one city to another. There have been one hundred fifty-five promotions in the city manager profession to date.

MUNICIPAL HOME RULE

Case Involving School Repairs.—An important decision was handed down by the Wisconsin Supreme Court, interpreting the Wisconsin Amendment, in the case of Sleeman *vs.* Baxter, the third home rule case to come before the court. The first case was that of Harbach *vs.* Milwaukee in which the constitutional power of the legislature to compel the city of Milwaukee to levy an annual tax for the repair of school buildings was involved. This was a friendly suit to determine whether the repair of school buildings was a local or a state function. The case was unfortunate in that it related to schools, which is generally considered a general state question, and the court so held that all matters relating to schools were matters of state-wide concern and consequently exempted from the home rule amendment. It was contended that the repair and maintenance of schools was a local matter which the city could finance by a tax levy, by bonds, or by any other method which it saw fit to use.

Regulating Height of Buildings.—The second case was also a Milwaukee case involving the right of the city to regulate the height of buildings. The legislature had enacted a law relative to the height of buildings and the city of Milwaukee afterwards enacted an ordinance fixing a higher limit. The question involved was whether the regulation of the height of buildings was a local, municipal affair or a matter of state-wide con-

cern. In the first instance the court ruled that the regulation was a matter of state-wide concern and that the act of the legislature should prevail, but when it came to write the decision it ran into various difficulties. The result was that the court recalled its mandate, reversed its decision, and wrote an opinion holding that the regulation of the height of buildings was a local affair falling within the home rule power.

Interpreting Wisconsin Amendment.—The Sleeman *vs.* Baxter case involved a question as to whether the legislature, since the enactment of the home rule amendment, had the power to enact laws relating to classes of cities. In this case the court held that the home rule amendment was a grant of power to the cities and not necessarily a general limitation on the power of the legislature. It clearly set forth the theory that the amendment did not impair the legislative power to enact laws relative to classes of cities, but it did give them a veto over all such legislation if the city chose to exercise its home rule power and enact a different regulation conflicting with the state act. The result of this decision is clearly to recognize the power of cities to set aside any act of the legislature relating to a class of cities by enacting a charter ordinance under the Home Rule Amendment. Until such time as a city acts under its home rule power, the law of the state relating to cities of that class will prevail. The effect of this last decision is to clarify greatly the situation in this state, and to place a very liberal construction on the Home Rule Amendment.

Water Supplied to Schools.—A section of the Ohio statutes forbids cities to charge for water supplied to public school buildings. A city possessing powers of local self-government under the state constitution adopted an ordinance requiring the local Board of Education to pay for water furnished to the school buildings of the city the same as other consumers. Annulling the ordinance, in the case of City of East Cleveland *vs.* Board of Education, the Court of Appeals for Cuyahoga County said, in regard to this important matter:

"The Legislature, in exercising the power and performing the duty imposed upon it by the constitution in reference to public schools acts for the whole state in reference to a matter affecting the whole state and which by the constitution is made a subject to state-wide government.

"The municipality in this case, in establishing and operating a waterworks system, acted in its proprietary function and in the exercise of its local self-governing powers for a very small part of the state. . . .

"There is therefore a direct conflict between two governmental agencies. The approval of the minutes of a meeting is nothing more than a certification that they are a correct record of the things that were done at the meeting, and not an approval of those things."

It was decided, however, that where a resolution levying taxes was invalid, because not adopted by a sufficient vote, it was validated by an ordinance properly passed within a year after the date of levy.

CHARTER REVISION

Milwaukee. — Proportional representation, the short ballot, the vesting of legislative power in the common council and the greater centralization of administrative control in the hands of the chief executive—the mayor—are the outstanding features of a new charter proposed for Milwaukee by the City Charter League. The charter draft provides that the only officials to be elected are the aldermen and the mayor. For the election of the common council the city is divided into three districts, each of which is a unit for the election of aldermen to be chosen by proportional representation for a term of four years, one alderman for each 7,000 votes cast. The number of aldermen will increase with the increase in the number of voters until it reaches twenty-five. The mayor, as the chief executive of the city, heads the city administration and appoints the heads of administrative depart-

ments for indefinite terms of office, with confirmation by the common council, but removable at his pleasure. There are five such departments, with a director at the head of each: namely, finance; legal; public works; health; and building and safety inspection.

METROPOLITAN AND REGIONAL PLANNING

By Thomas Adams

General Director, Regional Plan of New York and Its Environs

METROPOLITAN AREAS

Physical and Economic Problems.—It has come to be recognized that cities cannot be properly planned if plans are limited to the areas within their boundaries. This is particularly true of those large cities that combine with adjacent communities to form what are called metropolitan areas. In such areas it is essential that surveys and plans be made for all the land that is used for residence or industry within commuting distance of the central city. For instance, in New York the territory within a radius of 50 miles of Manhattan has to be planned in broad outline as one unit before a proper understanding can be reached regarding the physical and economic problems of such a large city as that of New York.

Plans and Surveys.—In the Boston metropolitan area there has been for a long time recognition of the need of metropolitan treatment of park, highway and sewerage systems. The Burnham Plan of Chicago, made in 1903-7, included proposals that were regional in scope. In 1918-19, a survey was made of the Niagara Region, comprising about 1,000 square miles in the United States and Canada, and as a result of this survey it was proposed that a plan be made for an international region lying on both sides of the Niagara River. Comprehensive regional planning was not started in this country, however, until 1922, when the Committee on the Regional Plan of New York and Its Environs began to make a survey and plan for the New York Region. This elaborate and complete regional survey and plan is now nearing completion.

REGIONAL PLANNING

Boston.—During the last few years, and especially during 1927 and 1928, there has been much activity in regional planning throughout the country. An indication of this activity is given in the brief summary which follows: In the Boston Metropolitan Region park, highway, sewerage and water supply systems have been planned separately for the combined areas of the city of Boston and about thirty surrounding municipalities. During the past year much has been done by the City Planning Board of Boston and the Metropolitan Planning Commission of the State in preparing highway and zoning plans for the metropolitan area.

Chicago.—The Regional Planning Association of Chicago is making studies and plans for an area of 8,000 square miles with a population of 5,000,000. During the year many highway and park proposals have been carried out as recommended. The Association, which is representative in part of groups of citizens and in part of government bodies, is devoting much of its activity to coördinating the plans of country, city and village authorities in the region.

Cleveland.—A Committee of the Cleveland Chamber of Commerce on Coöperative Metropolitan Government and a Cleveland Federal Regional Highway Committee have been promoting plans of transportation and of highway improvements for the area within thirty miles from the business center of Cleveland. The Regional Highway Committee has approved a Ten-Year Improvement Plan and a number of major arterial routes are expected to be carried out in 1929.

Los Angeles.—The Regional Planning Commission for the County of Los Angeles is an official body making a comprehensive plan for 4,115 square miles with a population of 2,271,151. It is making extensive studies of existing conditions and has made progress in regard to the completion of highway plans, zoning, and design and control of subdivisions.

Milwaukee.—The Milwaukee County Regional Planning Department is preparing a plan for major highways, parks, platting and zoning for an area of 240 square miles, in which there is a population of 700,000. Topographical surveys have been made, together with platting layouts for 20,000 acres. Plans have been prepared for highways, streets, parks and zoning for buildings.

New York.—The comprehensive plan for the largest urban region in the world being prepared by the unofficial advisory Committee on the Regional Plan of New York and Its Environs was completed in 1928. The Russell Sage Foundation has supplied the funds to enable the Committee to make its elaborate survey and plan for this region, which comprises 5,528 square miles and has a population of 10,000,000. Ten survey volumes are being published, dealing with economic, social and physical conditions, eight volumes being completed during 1928. Early in 1929 the two remaining survey volumes and two plan volumes will be published. Several schemes have been carried as recommended by the Committee, and numerous city, village and town planning commissions have been organized as a result of its work. Important changes in the laws of the State of New York have been drafted by its legal advisers and passed into law. Within the New York Region there has been formed the Westchester County Planning Federation, consisting of representatives of fourteen municipalities who are collaborating in making a plan for 446 square miles.

Niagara Frontier.—The Niagara Frontier Planning Board and Association are official bodies representative of Buffalo and other frontier municipalities. The Board is making a comprehensive plan for an area of 1,550 square miles with a population of 850,000. Maps have been prepared of the existing highway, park, transportation, water supply and sewerage systems. Many projects have been planned and some have been carried out.

Onondaga County, N. Y.—The Onondaga Regional Planning Commission is an advisory body which has dealt especially with parkways during the past year, for an area of 781 square miles. A base map of the county has been prepared and special studies are being made.

Philadelphia.—The Regional Planning Federation of the Philadelphia Metropolitan Region is an unofficial federation of groups of citizens. A plan is being made for 4,000 square miles, within which there is a population of about 3,500,000. Much survey and research work has been completed, and ten reports and bulletins have been published. This Federation is outstanding in regard to the extent it has been able to obtain financial support from some prominent citizens.

St. Paul and Minneapolis.—The metropolitan and regional planning association of the twin cities, St. Paul and Minneapolis, is a voluntary coöperative organization. Studies and plans are being made for 3,000 square miles in eleven counties with a population of 900,000. Nine committees are at work on major problems.

Toledo.—A planning board has been formed for Lucas County. It is representative of county commissioners and is dealing primarily with major highways and parkways. The area being dealt with is 40 square miles, with a population of 400,000.

Washington.—The creation of the National Capital Park and Planning Commission was an event of great importance in the regional planning movement because it was the result of action by the Federal Government in seeking to promote the planning of the future growth of the whole area of the District of Columbia and of adjacent areas in the states of Mary-

land and Virginia. The Commission was appointed to prepare a comprehensive plan dealing with highways, parks, recreation, zoning, transit, etc. The area of the main portion of the region is 450 square miles with a population of 680,000. Reports have been published including a special report on "The Development of the National Capital and Its Environs." Regional park and highway plans have been made. A Maryland-National Capital Park and Planning Commission has been established to collaborate with the Washington Commission. Special projects, especially dealing with parks and highways, have been carried out.

Miscellaneous.—Some degree of regional planning is also being carried out in Detroit; Pittsburgh; Madison-St. Clair Counties, Illinois; San Francisco, Monterey and Santa Barbara County, California; Tulsa, Oklahoma; Louisville, and Portland. It seems certain that in a very few years every metropolitan region will be organized to prepare a regional plan.

The expenditures of the various regional planning bodies probably already amount to about $2,000,000. The annual budgets of the largest schemes vary from $50,000 to $125,000.

Regional plans are also needed in great mining areas, and in such agricultural regions as the Boisé Valley in Idaho. The greatest need in regional planning, as agreed by those responsible for the schemes being prepared, is the education of the public with regard to the advantages of planning and the maintenance of a continuous planning organization in each metropolitan, mining or agricultural region that has common or related problems.

ZONING

By Harold S. Buttenheim

Editor, *The American City*

Forty-three cities and towns in 18 states were added to the list of zoned municipalities during 1928. The following list is compiled from Frank B. Williams's monthly "Zoning Notes" in *The American City*, and from the records of the Division of Building and Housing of the U. S. Department of Commerce which give the principal zoned cities and towns:

California
- Los Gatos

Colorado
- Boulder
- Grand Junction

Connecticut
- Waterbury

Idaho
- Boise

Illinois
- Alton
- St. Charles
- Winnetka

Iowa
- Sioux City

Maine
- Mount Desert

Massachusetts
- Barnstable
- Bedford
- Concord
- Weston

Michigan
- Grosse Pointe Park
- Jackson

Mississippi
- Yazoo City

Missouri
- Kirkwood

New Jersey
- East Paterson
- Hackensack
- Hopatcong

New York
- East Aurora
- Cove Neck
- East Rockaway
- Glens Falls
- Harrison
- Kenmore
- Lancaster
- Lake Placid
- Mount Kisco
- Mount Pleasant
- New Castle
- Rye
- White Plains
- Woodbury
- Yonkers

Ohio
- Canton
- Columbus

Pennsylvania
- Easton
- Trafford

Rhode Island
- Pawtucket

South Dakota
- Huron

Tennessee
- Knoxville

The addition of these 43 ordinances to the list brings the total number of zoned municipalities up to more than 600. Only two states are not represented, a remarkable showing when it is remembered that the first comprehensive zoning ordinance adopted in the country was that of New York City in 1916.

CLEVELAND'S ZONING ORDINANCE

On September 30, 1928, only thirteen of the sixty-eight cities in the United States of over 100,000 population were without a zoning ordinance. The following day a zoning ordinance was adopted by the City Council of Cleveland, which was to have become effective on November 10. The Cleveland city charter provides that an ordinance, unless passed as an emergency, shall not become effective until forty days after its passage, and that a referendum petition bearing names equivalent to ten per cent of the number voting at the last regular election, may be filed within forty days. A petition for a referendum was filed on November 9, and the Council certified the petition as being sufficient on November 26. Accordingly, the City Council repealed the ordinance, and reintroduced a zoning ordinance in a slightly modified form.

Charles E. Conley, City Plan Engineer of the Cleveland City Plan Commission, states that "one reason why the friends of zoning in the City Council adopted this method was that under the provisions of the city charter no way seemed to be possible for securing a vote before November, 1929. Those who were active in circulating the referendum petitions were a few property owners in a high class residential district who were insistent that their property be zoned for apartment houses. The petition was not the result of a popular demand, but the names on the petition were secured very largely by paid circulators."

NEW JERSEY COURTS UPHOLD ZONING

Perhaps the most important progress in zoning legislation and enforcement during the year was in New Jersey. Up to November, 1927, the New Jersey courts had taken an unfavorable attitude toward zoning ordinances. Following the adoption, at the election that month, of a constitutional amendment, a new zoning enabling act (Chapter 274 of the *Laws of 1928*) was passed by the legislature in April. The act conforms, in the main, with the provisions of the Standard Zoning Enabling Act of the Department of Commerce, but contains novel limitations on the powers of boards of adjustment, in that variances as to use can be granted only within 150 feet of the boundary of a district in which such use is authorized by the zoning ordinance. It is further provided, however, that variances in any part of the municipality may be granted on recommendation of the board of adjustment, if such recommendation is approved by vote of the legislative body of the community. Since the adoption of this act, the New Jersey courts, in numerous cases, have rendered decisions which indicate that reasonable zoning ordinances will be sustained, whether they originated before or after the passage of the new zoning enabling act.

POWERS OF BOARDS OF APPEALS

In other states, several important decisions relating to the powers of boards of adjustment, or boards of appeals, as they are variously known, have been rendered. One of the most important is the approval by the highest court of New York State of the contention that denial of variances, whereby real estate owners might make greater profits, does not constitute "unnecessary hardships" under the meaning of the statute.

VOLUME ZONING

During the year, Boston and Knoxville joined the small list of leading cities which regulate building heights by volume or cubical contents. The Boston amendment permits in the 155 feet height district the erection of any portion of the building to a greater height, provided the volume of the building does not exceed the

buildable area multiplied by 155 feet; and provided further that every part of such building above a height equal to 2½ times the width of the street but not exceeding 125 feet, sets back from street and lot line 1 foot for each 2½ feet of additional height. This permits the pyramidal type of building in certain sections of the city.

Similar provisions, in general principle, are to be found in the ordinances of Chattanooga, Tenn. (passed January 25, 1927), Milwaukee, Wis. (passed April 12, 1926), and St. Louis, Mo. (passed April 26, 1926).

UNREASONABLE ZONING

The Supreme Court of the United States, which in 1926 and 1927 had rendered important decisions upholding the constitutionality of reasonable and comprehensive zoning ordinances, made it clear in a 1928 decision (Netcow *v.* City of Cambridge, 157 N. E. 618) that arbitrary and unreasonable exercises of the zoning power will not be sustained.

RECENT ZONING LITERATURE

Among the important publications of 1928 in the field of zoning are an "Index to Zoning Decisions," by Edward M. Bassett and Frank B. Williams, issued by the Regional Plan of New York and Its Environs; a pamphlet by Harland Bartholomew, "What is Comprehensive Zoning?" issued by the National Conference on City Planning; and numerous articles and items on zoning ordinances and decisions published in *The American City*, *City Planning*, *National Municipal Review*, and *Housing*.

Bibliographies of exceptional value are *Planning Information Up-to-Date*, by Hubbard and McNamara, published by the Harvard University Press, and *Recent Housing, Zoning and Planning Literature*, by the National Housing Association.

An excellent source of general information on zoning, which may be consulted without charge, is the Division of Building and Housing of the U. S. Department of Commerce at Washington.

CITY PLANNING

By Harland Bartholomew

Harland Bartholomew and Associates, St. Louis

BROADENING TRENDS

The year 1928 marked a most significant turning point in the planning of American cities. It witnesses the change of trend from advocacy and promotion of the abstract idea of city planning to that of actual official adoption of comprehensive plans by legislative action. Heretofore plans of varying degrees of completeness and thoroughness of detail have been prepared and published by citizen agencies or by city plan commissions with the hope that such plans would become a general guide to council and to private builders and developers, but seldom with the hope that they would be officially accepted by the city and their enforcement sanctioned by law. Zoning plans, to be sure, have been adopted by ordinance and fully enforced but these were a limited part of the complete city plan.

This complete change has come about first through a growing realization that unofficial plans, no matter how well and completely prepared, would be accepted or ignored at will by officials and councils more concerned with political expediency than permanent planning; and secondly, because the machinery for official adoption and enforcement of plans has for the first time become available through the publication of the Standard City Planning Enabling Act by the same advisory committee of the Division of Building and Housing of the Department of Commerce that prepared the Standard Zoning Act several years ago.

LEGISLATION AND COURT DECISIONS

New York and California.—The Legislatures of New York and California were the first to enact laws

providing for the official adoption of city plans, and several cities in each of these states now possess official city plans. That of Schenectady, N. Y., is particularly interesting since it combines a new topographic survey, zoning districts and proposed new street lines and parks, as well as other elements of the plan.

Michigan Case of Land Seizure.—Of particular interest is a decision of the Supreme Court of the state of Michigan bearing directly upon this question (Ridgefield Land Company *v.* The City of Detroit, 217 N W Rep. 58), holding that "a statute may require a subdivider to dedicate a reasonable amount of his land without compensation for streets in conformity with a comprehensive city plan as a prerequisite to the record of the plat of subdivision, since this is not a taking of land by eminent domain but is, under present conditions of city life and growth, a proper exercise of the police power."

SPECIFIC PROGRESS IN CITY PLANNING

Forecast.—The next ten years will witness adoption of official plans by cities throughout the country as numerous and as fully discussed and resisted in the courts as have zoning ordinances during the past ten years.

Washington.—Among the accomplishments in city planning in the capital city in 1928 was the zoning of 140 square miles by the Maryland Commission, and the beginning of construction of a triangle group of government building to house the Department of Commerce, Bureau of Internal Revenue, etc. Authorization and appropriation for the Mount Vernon parkway, and for a comprehensive regional and District park program including the Potomac River, was presented to Congress in the Cramton Bill. Washington spent $800,000 on park purchases during the year.

Chicago.—Of specific accomplishments in cities during 1928 it is difficult to find a complete record. The plan of Chicago proceeds apace with more and more of its lake shore development assuming its definite and permanent form, the opening of Wacker Drive and continued progress in the straightening of the Chicago River and associated terminal rearrangements. A temporary setback has been encountered due to failure of bond issues for several important street projects due more to distrust of the present city administration, however, than to lack of confidence in the city plan.

In St. Louis, the widening of Olive Street from 60 to 100 feet for a distance of two miles west from the business district was completed and opened to traffic in June. It has stimulated public interest and support in all other phases of the city plan, has provided much increased traffic capacity and greatly increased property values. Following decisions by high courts sustaining zoning for multiple dwellings on Lindell Boulevard, St. Louis' leading thoroughfare and principal approach to Forest Park, property values increased from $100 or so per front foot to $700 and more,—an increase far greater than the most optimistic hopes of those who had hoped to commercialize this beautiful street.

In San Francisco, which voted over $9,000,000 for several new major streets and boulevards in November, 1927, bonds for numerous planning projects such as parks, playgrounds and a large street tunnel, were defeated in this November election.

In Fort Worth, Texas, following the adoption of a major street plan, building lines for the enforcement of the plan were established on forty miles or more of these major streets under authority of a special provision of the city charter whereby no compensation is paid until the ultimate acquisition of title at the time the street widening is consummated.

In Knoxville, Tennessee, the most important project in its entire city plan, the opening and widening of Henley Street, was approved and is now under construction at a cost of $800,000. Its particular significance is in enlarging the business district from a single street to an area some five blocks wide,—a perfect example of city planning. A new bridge across

the Tennessee River from the new Henley Street to cost about $1,000,000, was also approved by the electorate of Knoxville. In addition to these things, this comparatively small city in the mountains of East Tennessee has, during 1928, passed a comprehensive zoning ordinance and a comprehensive transit plan that was accepted by the local operating company. Several new bus lines were installed in accordance therewith, thereby supplementing the present trolley service which had not been extended for several years.

In Baltimore the widening and extension of North Howard Street, a six million dollar project, was approved by the voters of that city.

In Toledo, $3,000,000 was voted for a new bridge across the Maumee River, a most important project in the city's plan.

In Akron, projects for street widening, viaducts, paving and grade crossing elimination, totaling $8,840,000, were approved at the polls.

In Philadelphia plans for very large terminal rearrangements and splendid new passenger terminals have been announced by each of the three principal railroads serving that city. These plans have been worked out through long years of study and negotiation and aside from their value in removing certain obstructive features of present facilities will become in two major instances integral elements in the beautification of the Schuylkill River embankments.

GENERAL PROGRESS IN PLANNING

These are some of the notable achievements in City Planning in American cities in 1928. It is by no means a complete record. In city after city, through subdivision control, through enforcement of zoning ordinances, through a street rearrangement or transit line re-routing here and there, less spectacular but nevertheless significant rehabilitation and effective planning of new areas proceeds with vigor and with increasing thoroughness.

Several interesting and valuable plans and reports have been published during the year. These are too numerous for mention or review here. Among the most notable are the Report of the City Committee on Plan and Survey of New York City and several volumes in the final series of the Regional Plan of New York and Environs.

FIRE PREVENTION AND MUNICIPAL MISCELLANIES

By Clinton Rogers Woodruff

Honorary Secretary, National Municipal League

FIRE PREVENTION WEEK

Publications.—The National Fire Protection Association issued valuable material for use in connection with Fire Prevention Week, including a striking two-color poster 12 x 6 inches, entitled "Better To Be Safe Than Sorry"; a four-page two-color *Story of Fire Prevention Week;* a fifth revised edition of the *Fire Prevention Handbook,* 50 pages, illustrated; and *Facts about Fire.* This material was intended for quantity distribution.

Organizations Cooperating. — A sticker designed for use on correspondence, parcels, etc., was prepared for use in connection with Fire Prevention Week which was observed Oct. 7-13. The organizations cooperating were the Chamber of Commerce of the United States, Washington, D. C.: the National Fire Protection Association, 40 Central Street, Boston; and the National Board of Fire Underwriters, 85 John Street, New York.

NATIONAL FIRE LOSS

New Low Record.—The year 1928 witnessed the establishment of a new low record in the national fire loss total, which was reduced last year for the first time since 1919. The New York *Journal of Commerce,* which

compiles fire loss statistics throughout the country, estimated recently that the fire loss during the first seven months of 1928 was $9,000,000 less than during the corresponding period of 1927. The National Board of Fire Underwriters placed the 1927 fire loss of the country at $478,245,620, as compared with $560,548,624 in 1926. These figures are encouraging to cities whose officials and civic bodies have for years been active in sponsoring fire prevention programs in their respective communities. They do not justify, however, temporary abandonment or any curtailment of the local fire prevention work. Increased efforts may yet bring America more into line with the much lower fire loss records of other civilized countries.

FIRST ANNUAL NORTHWEST FIRE SCHOOL

The first annual Northwest Fire School was held at the University of Minnesota, August 13-17. It was a great success, evidenced by an attendance of 248 persons from seventy-nine municipalities; by the genuine interest expressed at the conferences in the demonstrations of approved methods of fighting fires; by the exceptionally well-prepared papers upon practical topics; and most important of all, by the insistence that a second session of the school be held during 1929. In initiating and conducting the fire school in cooperation with the University of Minnesota, the League of Minnesota Municipalities has entered into a new type of activity,—educational work applying to the work-a-day problems of municipal government and emphasizing the duties and obligations of public servants. It is not unreasonable to expect that the League will develop increasing energy in sponsoring schools of this kind. Schools and conferences may be adapted to each and every class of public officer. The Northwest Fire School represents a beginning certain to develop in future years. Significantly, the fire fighters by their own example have pointed a way to other groups of public servants.

FIRE PREVENTION MOVEMENTS

Philadelphia made the best showing in fire prevention. It was not a mere accident, but the culmination of effort beginning in 1911. The Philadelphia Chamber of Commerce, in making a survey of the principal city problems which should demand the attention of the leading citizens, was not long in discovering that fire waste in both life and property was not only a problem on which the entire city might unite, but also a movement which should command its most intelligent effort. After careful consideration, the Board of Directors decided to appoint a Fire Prevention and Insurance Committee, which might serve as a clearing house for all organizations and individuals in Philadelphia who were interested or could be interested in the matter of fire prevention. The success of the movement would naturally depend upon the personnel of the committee, and it was therefore necessary to scan the membership of the organization very closely and choose men who not only had knowledge of the essentials to be considered in the development of such a program, but would and could whole-heartedly give their attention continuously to the work. That the work was well done and persistently carried out is shown by the winning of the award.

The Underwriters Laboratory (207 East Ohio street, Chicago) reports that 1928 was one of advancement and progress in fire protection and prevention. Life and property were made safer with this organization's laboratories working as one factor toward these results. New devices and products have been presented for investigation, and that work with the tests and checks of improvements on listed appliances, and the regular routine work have kept all departments busy throughout the year. Contact with the advancement of related problems was maintained by 29 members of the staff serving on the 255 committees of 39 different national organizations, societies, and conferences. The chairmanships of 18 of these committees are held by representatives of Underwriters' Laboratories.

Fire Hazard Plan.—Rendering negligent owners of buildings liable for the cost of extinguishing fires that result from failure of the owners to comply with the orders for the removal of fire hazards, is commended as a means of practical fire prevention in a recent issue of *Housing Betterment* (now *Housing*), the quarterly of the National Housing Association. This plan, in the form proposed by a committee of the New York State Conference of Mayors and Other Municipal Officials, was briefly presented in *The American City* for November, 1927. *Housing Betterment* comments that America still leads the world in the unenviable reputation of wasting more money in preventable fires than any other civilized nation and that it still has far to go before it can even approximate the condition in Europe, where the loss of both life and property from fire is practically negligible, because of the greater regard and efforts for conservation.

Electrical Installation Rules.—The majority of the larger cities and many of the smaller towns require that all electrical installations shall be made in accordance with the requirements of the National Electrical Code, and most of these cities provide electrical inspectors to see that all new work is up to standard. Once the installations are completed, however, only a few cities make any effort to see that existing equipments are maintained in a safe condition. Careful inspection of new work is necessary, and has proved its usefulness, but, relatively speaking, reinspections are of more importance. Permits are required for all new installations, and these installations are made by licensed electricians, and, if it is generally known that the requirements of the code are rigidly enforced, little difficulty is experienced in securing safe installations. Once an installation is completed, however, there is no way of knowing its condition except by frequent reinspections.

NATIONAL FIRE ASSOCIATION

Committee Activities.—President Dana Pierce retired in May after serving for two years as President of the National Fire Association. Seventeen members of the staff are serving on 68 committees of that organization. Among them are A. R. Small, who is chairman of the Electrical Committee which completely revised and brought out the 1928 edition of the *National Electric Code*, and C. R. Welborn, who wrote the report recently issued by the National Fire Protection Association on "Rural Fire Fighting Apparatus." Fifteen laboratories' men are serving on 61 committees of the American Standards Association, which is the new name adopted by the American Engineering Standards Committee, and six are on 21 committees of the American Society for Testing Materials. Four men are serving on five committees of the National Fire Waste Council of the United States Chamber of Commerce.

New Directors and Council Members.—The places of members of the Board of Directors who resigned during the year were filled by Victor Roth, of New Haven, Conn.; C. R. Street, of Chicago; and B. M. Culver, of New York. Eleven new council members were elected in 1928 to fill vacancies and bring the Councils up to full membership. Two meetings of the Burglary Protection Council were held in New York, one on April 27th and the other on October 10.

MODEL ORDINANCES

A collection of model ordinances has been developed by the League of Minnesota Municipalities and is recommended for adoption in villages of that state. They are: "An Ordinance Providing for the Establishment of a Volunteer Fire Department and Making Rules and Regulations for the Government of the Same"; "An Ordinance Fixing Fire Limits, Establishnig a Building Code, and Prescribing Penalties for the Violation Thereof"; "An Ordinance Requiring Permits for Sale at Retail of Certain Fireworks and Providing a Penalty for Violation Thereof"; "An Ordinance to Promote Public Safety by Regulating the Manner of Construction of Radio Antennæ and

Guy Wires"; and "An Ordinance Relating to the Burning of Trash."

MUNICIPAL RADIO STATIONS

A monthly bulletin of the Radio Service, United States Department of Agriculture, contains a list of all broadcasting stations with indications of the owner of each station. Nine stations are listed as municiwith 5,000 watt power (WPG); Camden, N. J., 500 watt (WCAM); Dallas, Texas, 500 watt (WRR); Fort Morgan, Colorado, 100 watt day and 200 watt night station (KGEW); two Florida stations, Jacksonville, 1,000 watt (WJAX), and Pensacola, 500 watt (WCOA); Seattle, Washington, Harbor Department, 15 watt (KKP); and finally New York City, Department of Plant and Structures, 500 watt (WNYC). When compared to the total number of all classes of radio stations in the United States the number of municipal radio broadcasting stations is decidedly small. When compared with the number of city-owned stations throughout the world it bulks large, as that total is 11. Only two foreign cities have municipal radio stations. There is one in South America and one in Europe. The relatively small number of foreign municipal stations is undoubtedly explained by the number of government-owned and operated stations. There are 75 of these, most of which are located in the large municipal centers and serve much the same purpose as our municipal stations.

MISCELLANIES

National Municipal League.—Dr. Harold W. Dodds resigned as Secretary of the National Municipal League and was succeeded by Russell Forbes, the Director of Municipal Administrative Service, 261 Broadway, New York City. Dr. Dodds continues as editor of the *National Municipal Review.*

The City Club of Chicago celebrated the 25th Anniversary of its founding on December 12th.

STREET SIGNS

Municipal Administration Report.—A report on street name signs has been prepared by the Municipal Administration Service, described in the introduction as follows: "Street name signs are intimately related to the traffic problem. The absence or inadequacy of signs contributes to delay and congestion of pedestrian and vehicular traffic, and gives visitors and tourists in any city a bad impression. Clear and understandable signs, legible night and day, contribute to the comfort and security of motorists, and materially aid those charged with handling traffic. To determine the most practicable size, style and placement of signs, a series of experiments was carried on in Boston by Adolph J. Post, Senior Assistant Engineer of the Public Works Department and George H. McCaffrey, then secretary of the Good Government Association of Boston and now acting director of research of the Merchant's Association of New York. These experimenters have now joined hands as the authors of this pamphlet which sets forth the results of their investigations."

The report considers the following subjects: need for street name signs: style, size, and proportion of lettering on signs; material used in signs; color and texture of signs; matter on the sign; location of signs; and summary recommendations. Appendices include specifications for signs and a list of the cities cooperating in furnishing information. The Municipal Administration Service (261 Broadway, New York) sends copies of the specifications to municipal officials interested in the subject. Several cities have already made use of this service. Toledo, for instance, has purchased 600 street name signs of a type recommended in the report. A letter from the mayor's office reported that the cost per sign was $3.15.

MUNICIPAL INSTITUTES

The Institute of Municipal Administration was launched by the University of Southern California in August. Institutes of various kinds, at which national and international subjects are discussed, are coming to be a marked feature of cultural prog-

ress in this country. The California project claims distinction as the pioneer in an intensive course of study on municipal administration and public work. It was attended by mayors, managers, commissioners, and other city and county officials, together with educators of note here and abroad. One of the chief features was a series of six sessions headed by Prof. William B. Munro of Harvard University, a vice-president of the National Municipal League, that covered the relation of the city to the state; municipal home rule, its value and limitations; the city charter; and mayor-and-council form of government; the commission plan of government; the organization of city departments; the city manager plan, and the forms and functions of county government.

STATE MUNICIPAL LEAGUE MAGAZINES

(m—monthly)
(bm—bi-monthly)

Pacific Municipalities (m)
706 Chancery Building
San Francisco, Cal.

Colorado Municipalities (bm)
University of Colorado
Boulder, Colorado.

Florida Municipal Record (bm)
1601 Lynch Building
Jacksonville, Florida.

Illinois Municipal Review (m)
Urbana, Illinois.

American Municipalities (m)
21 West Main Street
Marshalltown, Iowa.

Kansas Municipalities (m)
Lawrence, Kansas.

Michigan Municipal Review (m)
Ann Arbor, Michigan.

Minnesota Municipalities (m)
16 University Library
Minneapolis, Minn.

Missouri Municipalities (bm)
B. & P. A. Building
Columbia, Missouri.

Nebraska Municipal Review (m)
2222 Avenue A
Kearney, Nebraska.

New Jersey Municipalities (bm)
34 West State Street
Trenton, N. J.

North Carolina Municipal Review (m)
Chapel Hill, N. C.

Oklahoma Municipal Review (bm)
206 Law Building
Norman, Okla.

Borough Bulletin (bm)
State Association of Boroughs
Capitol Building
Harrisburg, Penn.

Texas Municipalities (m)
815 Capitol Avenue
Houston, Texas.

Virginia Municipal Review (m)
Travelers Building
Richmond, Va.

The Municipality (m)
City Hall
Milwaukee, Wis.

COGNATE SOCIETIES

National Municipal League.—261 Broadway, New York City.

American Civic Association.—Union Trust Building, Washington, D. C.

American Municipal Association.—Lawrence, Kan.

American Society for Municipal Improvements.—3817 Olive St., St. Louis, Mo.

National Institute of Municipal Research.—261 Broadway, New York City.

International City Managers Association.—Lawrence, Kan.

Governmental Research Association.—261 Broadway, New York City.

National Civil Service Reform League.—8 West 40th St., New York City.

Better Government League.—Washington, D. C.

DIVISION VI

TERRITORIES AND SPHERES OF INFLUENCE

ALASKA AND HAWAII

By Frank McIntyre

Chief, Bureau of Insular Affairs, War Department

ECONOMIC CONDITIONS IN ALASKA

Commerce.—Governor Parks reports that the industrial conditions and the economic situation in Alaska were as satisfactory as could be expected during the year which closed June 30, 1928, in view of the unexpected decline in the production of the salmon fisheries and in the value of the mineral output, which are the principal industries in Alaska. A summary of the commerce shows a decided decrease, due primarily to the unusually small run of salmon during the season. Customs records disclose a decrease of $26,055,973 in the shipments from Alaska to the United States and an increase of $1,332,554 in the value of shipments to the Territory. The total commerce, foreign and domestic, is valued at $87,357,517, as compared with $112,081,000 for last year, or 22.05% less. Nevertheless, the balance of trade in favor of Alaska was $20,566,605. The exports were valued at $53,962,161, as compared with $80,018,034 for 1927, while the imports were reported to be $33,395,456 in 1928 and $32,062,902 in 1927.

Industrial Outlook.—While the revenues derived from the major industries declined, the capital investment and the number of persons employed in them increased. Labor was well employed and there were no widespread epidemics. The outlook for an early development of the pulp and paper industry has never been more encouraging. The Governor predicts that within the next four years the manufacture of paper will take its place as one of the major industries of the Territory.

Finances.—The Territorial finances are in excellent condition. Treasury receipts from all sources exceeded expenditures by more than $150,000. The balance in the treasury at the close of business December 31, 1927, was the largest for any year within the last decade. The last Congress made an appropriation for the building of a new capitol building in Juneau.

Agricultural activities have made considerable progress during the past year. Farmers are turning their attention more and more to dairying.

Fisheries.—The 1927 fishing season, as a whole, was a grievous disappointment. There was a decline of approximately 50% in the number of salmon caught as compared with 1926. The mild-curing of fresh salmon increased decidedly, the production being the largest on record. The herring industry continued to decline, as it has in recent years. There was a slight decrease in the output and value of the cod fisheries. The output of shellfish, clams, shrimps and crabs was materially less than it was in 1926. Although the number of whales taken was 137 more than in the preceding year and the quantity of products likewise increased considerably, there was a decline of about $57,000 in the value of the products of the whaling industry,—oil, meat, fertilizer and whalebone. The production of halibut was maintained at a high level.

Furs.—The value of the land fur-

bearing animal pelts shipped from the Territory during the calendar year 1927 was $3,657,940.68. It is estimated that there are 808,870 seals in the herds on the Pribilof Islands. The increase last year was 47,589, or 6.25%. It is interesting to note that, due to the protection of the government, these herds have increased from 132,000 in 1911 to more than 808,000 in 1927. During the year, 24,942 seal skins were taken from the Islands, and in the same period 20,315 fur seal skins were sold at public auction at St. Louis, Mo., for a gross price of $718,101. Fox skins were also sold at these auction sales for a gross price of $79,172.

Reindeer Industry.—A careful count was made this year of the number of reindeer, and it is estimated that there are 321,116, of which 5,526 were owned by the government. Last year, Congress provided for the appointment of a reindeer supervisor who is to have jurisdiction over the entire reindeer service and establish the herds on a sound commercial basis.

MINING

A great deal of interest has been shown by prospectors in the offer of the Territorial Legislature to assist them during prospecting trips. One hundred and twenty-seven applications have been made and vouchers covering assistance to prospectors amounted to $5,990. The mineral production of the Territory for 1927 is valued at $14,404,000, as compared with $17,664,800 in 1926. There was a decrease in the production of placer gold due to an unusually short, dry working season, while gold lodes showed an increase of production for the year. There was also a decrease in the tonnage and value of the output of copper. For the first time in many years, the production of coal from the mines in the Territory greatly exceeded the importation of this commodity from foreign sources. There has been a noticeable improvement in the equipment and operation of the coal mines and the result is a better and less costly product. More coal was produced in 1927 than in any other year since coal mining began in the Territory, with the single exception of 1923. A new industry that is somewhat related to the quarrying of marble started late in 1927 on Dall Island. This is the quarrying of a high grade lime rock which is to be shipped to Seattle and mixed with the other necessary constituents to make cement.

EDUCATION

It is estimated that there are more than 30,000 natives in Alaska. The administration of their affairs, in so far as education, medical relief, industrial training, and relief of destitution is concerned, is under the control of the Bureau of Education, U. S. Department of the Interior, the office of the superintendent in charge being in Seattle. During the year, 94 schools were in session with 177 teachers and an enrollment of 3,755 native pupils. Every phase of the work of the U. S. Bureau of Education is hampered by a lack of funds. There are large villages without school facilities; some of them have more than 50 children of school age; many sections are without medical attention of any kind; the hospitals are the best that the limited appropriations will provide, but they are woefully inadequate. There is urgent need for more industrial schools for the natives.

The Legislature made generous appropriations for the Territorial schools and for the Agricultural College and School of Mines. The Territorial schools are for white children and children of mixed blood leading a civilized life, and are under the supervision of a commissioner of education with headquarters at Juneau. During the last year, 16 high schools and 90 elementary schools for such children were maintained. Two hundred and thirty-five teachers were employed for these 4,828 pupils at a cost of $584,892.21. Illiterate adults are afforded an opportunity to improve their condition in citizenship night schools. Seven of these schools were conducted during the year.

TRANSPORTATION

Railroads.—The work of completion and improvement of the Alaska

Railroad was advanced. Tourist traffic over the railroad continued to improve. The revenues from all sources increased 8.3%. The operating ratio of the railroad decreased from 164.83 in 1927 to 159.32 in 1928. The deficit which last year for the first time in the history of the project was less than $1,000,000 was reduced to $840,890.

Roads and Trails.—The work of the Alaska Road Commission was largely directed to extending the rehabilitation begun in 1920 to trails and roads in remote portions of the Territory, and these roads and trails are in better shape than ever before. At the close of June 30, 1928, the Alaska Road Commission reported 10,754 miles of roads and trails under their supervision. Sixty-seven and one-fourth miles of new wagon road were constructed during the year.

Aviation has progressed in the Territory far beyond the expectations of its most optimistic advocates. There are now 58 landing fields and 4 commercial airplane companies operating 9 planes. It is significant to note that every dollar invested in aviation in Alaska has been subscribed in the Territory.

HAWAII

General Conditions.—Governor Farrington reports that Hawaii has maintained the good standard of health and prosperity that has marked the life of the Islands in recent years. The steady decrease in infant mortality and the greater increase in the number of pupils in the public schools may properly be noted as the factors of greatest significance for the future.

Anniversary of Discovery.—The year 1928 marks the 150th anniversary of the discovery of the Hawaiian Islands by Captain James Cook. On March 7th, the President approved a Joint Resolution of Congress authorizing him to invite the Government of Great Britain to participate in this celebration by sending a man-of-war with delegates representing the Dominions most interested. This met with favorable response from Great Britain, the Commonwealth of Australia, the Dominion of New Zealand, and the Dominion of Canada, and naval vessels were authorized to participate with ships of the United States in appropriate formal ceremonies in August. The President approved an act of Congress authorizing the striking of a souvenir coin to commemorate the event.

Population.—The population on June 30, 1928, was estimated to be 348,767, the increase for the year being 15,347. The population has steadily strengthened in the proportion of citizens to aliens. The citizenship population has increased by 10,658. The major racial increase was in the total Filipinos, which race increased by 7,181 in the excess of arrivals over departures. The alien population, excluding Filipinos, has decreased by 2,205. The racial classification follows:

Ancestry	American and European	Hawaiian	Part Hawaiian	Filipino	Japanese	Chinese	Others	Total
American citizens.	64,397	20,720	25,984	8,208	83,252	15,058	10,657	228,276
Aliens	4,031	.....	.....	51,870	51,348	10,252	2,990	120,491

FINANCES

The gross valuation of real and personal property assessed for taxes is $390,558,491. The Territorial taxes collected totaled $14,884,100. The Territorial bonded indebtedness is $28,585,000. The evidence of prosperity is the increased money in the savings banks. The total bank deposits are $80,210,063, of which $31,278,434 is in savings banks, an increase in savings deposits of $4,176,214. Filipino residents of Hawaii have probably made a better record for placing their money in the local savings banks than any recent immigrant laborers that have come to the islands. Recent figures indicate that some 9,600 Filipino accounts aggregate over $2,000,000 in savings bank deposits. Thirty-one banks were in operation at the close of the year.

This year, the Territory paid to the Federal treasury $6,244,381.78 (derived largely from the Federal income tax), which is more than is paid by each of 16 sovereign states of the Union. If to this total were added the annual collection through the customhouse of $1,881,787.20, the Territory would contribute more than some 20 states of the Union. Ever since it took its place in the Union as an organized Territory under the organic act of 1900, Hawaii has borne all the Federal revenue payment responsibilities of a state. It has more than paid its own way in revenue payments to the Federal government and, at the same time, has carried on its local administration and domestic development of public works, public schools, health control by local taxation, under local governmental control. The United States has finally passed acts granting to Hawaii all the benefits of Federal aid that are enjoyed by the several states.

TRANSPORTATION

Railway and Street Transit.—There are steam railroads on all the principal islands. The Honolulu Rapid Transit & Land Co. controls and operates the only street railway system in the Territory. The Territorial government is spending more than a half million of dollars to establish a terminal at Nawiliwili, island of Kauai, where a breakwater has been completed by the Federal government. When the terminal is finished, every principal island will have a protected harbor with port facilities for the quick dispatch of traffic.

The tourist trade is Hawaii's fastest growing and most interesting means of livelihood. The non-resident passengers arriving at Honolulu totaled 17,451, a gain of 698 for the year.

Aviation.—The day is not far distant when all the principal islands will have regular airplane service. Hawaii has been brought into the limelight frequently during this past year in an aeronautical and historical manner. The historical and pioneer flights in which the Territory was involved during the year included three nonstop flights from Oakland, California.

EDUCATION

Public Schools.—The total expenditures for public schools for the year ended June 30, 1928, was $5,741,788.18. The public school buildings for many years past have been provided by direct taxation. They number 185, with 2,298 teachers and 66,434 pupils. The movement to equip Hawaii's boys and girls to enter the agricultural industries has met with good results. Fully 12,000 pupils were employed in agricultural work during the summer vacation of 1927. Shopwork has been much emphasized.

University of Hawaii.—The year has been one of great progress for the University of Hawaii. The Association of American Universities has placed the University of Hawaii on its accredited list, which gives it rank equal to the best universities of the country; Federal aid in agricultural experimentation and extension work has been extended, which is a practical recognition of its standing and accomplishments. By the terms of an act approved by the President on May 16, 1928, the University will share on an equal footing with the state universities in the several acts of Congress which give Federal aid to experiment stations and extension work.

HEALTH

Health conditions for the year were excellent. The birth rate was 33.84 per 1,000 population as compared with 37.16 for 1927. The death rate was 11.7 per 1,000 as compared with 11.87 for 1927. The infant mortality rate dropped from 95.97 in 1927 to 83.69. Tuberculosis and diphtheria increased. Steady improvement continues in the treatment and control of leprosy. The number of patients at the Leper Settlement, Molokai, on June 30, was 496.

ECONOMIC CONDITIONS

Commerce.—The imports, foreign and domestic, for 1927, amounted to $88,837,477 as against $86,517,189 in 1926; and the exports, $111,504,035

as against $100,145,020 for the previous year.

Agriculture.—Agricultural industry has prospered. The 1927 sugar crop showed the largest total production in the history of Hawaii, being 811,333 tons. The weather conditions have been particularly ideal for the growing of cane during 1927 and 1928. General improvements in agricultural methods, conservation of irrigation water, use of better cane varieties, and more exact fertilization and timing of field operations have all played their part in increased production.

Sugar.—The notable feature is the steady and increased production of sugar to the acre. The cultivated acreage is about the same. Labor conditions on the sugar plantations have been particularly good, there being no disturbances and every evidence of contented laborers and satisfied conditions. At the end of December, 1927, there were nearly 20,000 houses, approximating $14,000,000, owned by the sugar plantations for the housing and accommodation of its employees.

Pineapples and Coffee.—Canned pineapples, valued at $33,845,351 were shipped to the United States in the year under review. This is the second industry and has gained a world-wide reputation. Coffee of an exceptional quality has been produced in the islands for years. The coffee export for the year was $1,779,809. This industry, except for the milling and marketing, is carried on mainly by Japanese. The area planted in coffee is increasing.

DOMESTIC EXPORTS

(Fiscal years 1926 and 1927)

Articles	United States, 1927	Foreign, 1927	Total, 1927	Total, 1926
Sugar	$ 69,827,821	.....	$ 69,827,821	$ 59,043,395
Coffee	1,397,720	$ 382,089	1,779,809	876,181
Fruits and nuts	33,845,351	1,088,736	34,934,087	35,093,777
Rice	8,034	17	8,051	5,533
Hides	170,034	.....	170,034	138,748
Miscellaneous	1,120,555	778,994	1,899,549	4,944,153
	$106,369,515	$2,249,836	$108,619,351	$100,101,787

PORTO RICO

By Frank McIntyre

Chief, Bureau of Insular Affairs, War Department

ECONOMIC CONDITIONS

External Trade.—Governor Towner's report for the fiscal year ending June 30, 1928, shows the steady growth of the commerce of Porto Rico. The total external trade in 1900 was $16,000,000; in 1928, it was $195,877,000. Ninety per cent of all the trade is with the United States. The four principal products produced in Porto Rico are sugar, tobacco, coffee, and fruit, the values exported this year being: sugar, $54,579,000; tobacco and tobacco manufactures, $20,778,000; coffee, $7,838,000; fruit, $7,539,000. The total exports declined from $108,000,000 in 1927 to $103,500,000 in 1928, in part, due to the very low price of sugar. There was a decrease of $4,113,444 in the value of tobacco exports. Another contributing factor was the falling of coffee exports from 19,000,000 pounds in 1927 to 7,000,000 pounds in 1928. This year coffee sold at an average price of 33¢ per pound, which is the highest price for which it has sold since the American occupation. The fruit industry is being rapidly and intelligently developed in Porto Rico. The production of fruit has shown an important increase during the year and the value of fruit exports was the largest amount ever reached. The needle-

work and embroidery industry has become one of the most important in the island.

Sugar Production.—Porto Rico's sugar crop of 1928 was the largest ever produced. It amounted to 748,677 tons, an increase in quantity of 30,751 tons. The increases were obtained by varietal selection and the successful control of cane diseases. What would be considered enormous yields in tonnage of cane and sugar were produced on the plantations in the southern parts of the island, where the sugar lands were irrigated. Fields were reported producing from 90 to 100 tons of cane per acre. The price, however, was very low, declining from $95.25 to $90.12 per ton. There has been an increase of more than ten per cent in the number of laborers engaged in the cultivation and grinding of sugar cane, an increase in wages, and some improvement in housing conditions.

Economic Problems.—Governor Towner thus describes the present situation: "The problems of an overpopulated territory and periods when large numbers are without work still confront Porto Rico. Unemployment, however, is both seasonal and sectional; it is not universal. There are more persons employed in any season in Porto Rico than ever before, and the periods of work are longer now than ever before. Wages, on the whole, are higher now than ever before. And these increases are decidedly greater than the percentage of the increase in population. There has been a large increase each year for the last five years in the amount of government work, in general business and in the building of private residences. There has been an increased volume of trade. Transportation has largely increased. All this has created a constantly increasing demand for labor. It is true that in some places during certain periods there is little work and many idle. There are also places where there is at times a demand for labor and not enough laborers to supply the demand. These conditions are found to exist in the United States and other countries. It is true that Porto Rico needs additional industries to create enough demand for labor to eliminate unemployment. Every effort should be made to secure new industries. It is also true that the wages paid for labor in Porto Rico are too low."

Hurricane Damage.—At the end of the fiscal year, every industry was going forward, but this satisfactory situation was changed when, on September 13th, Porto Rico was visited by the most severe hurricane on record in the Island's history. The committee appointed by the Governor to determine the losses arising from the hurricane reports the grand total to be $85,312,120. The most serious of all were the crop losses, estimated at $46,460,889. Coffee alone suffered to the extent of $18,182,000; sugar, $17,337,000; citrus fruits, $2,713,866; coconuts, $1,650,829. Considerable damage was done to roads, bridges, telegraph, telephone, water and sewer systems, and irrigation works. Seven hundred and seventy schoolhouses were destroyed or damaged. The damage to private dwellings is great, amounting to nearly $5,500,000. Fortunately, the loss of life was small, amounting to less than three hundred in a population of approximately one and a half million.

FINANCES

At the end of the fiscal year, there was an improvement in the insular finances. The cash receipts, amounting to $12,446,219, were the largest ever collected in Porto Rico. The net operating revenues of the government during the fiscal year were $12,320,571, a substantial increase over the preceding year. The excise taxes collected showed an increase of $1,183,188 and was the largest amount of such taxes ever collected there. Increases were also shown in taxes on income and customs collections. The net operating expenses amounted to $10,350,575, or $411,163 less than the preceding year. During the year, $2,000,000 of public improvement bonds, $475,000 of Isabela irrigation bonds, and $500,000 of irrigation construction bonds were sold, bringing the amount of outstanding bond obligations of the Insular Government on June 30, 1928, up to $25,517,000. The

total amount of municipal indebtedness is $20,123,500. As showing the credit of the island, the public improvement bonds sold at 108.35 and the irrigation bonds at 106.443 and 109.267, respectively. The treasury position has suffered a severe set-back as a result of the recent hurricane.

PUBLIC WORKS

Roads and Irrigation.—The total amount of macadamized roads completed in Porto Rico on June 30th was 1,705 kilometers, of which 275 were constructed by the Spanish Government and 1,430 by the American Government. Thirty-two kilometers were completed during the year. The Isabela Irrigation System is now approaching completion. Water is being delivered as lands are prepared to receive it.

Public Buildings.—Particular attention has been directed to the public building program. The new Capitol is the outstanding one of these buildings. It will be ready for the occupancy of the Legislature in the coming February. This building will cost, when completed, something in excess of $2,000,000. Other buildings approaching completion are the new Asylum for the Insane, the Penitentiary, and a number of buildings constituting the tubercular sanatorium.

EDUCATION

The acquisition of English and the conservation of Spanish continued to be stressed. Greater emphasis on oral English was urged. To combat and reduce illiteracy has been and remains one of Porto Rico's most serious problems, and encouraging results have been secured this year. In the public schools, there were employed 4,478 teachers, 143 from the United States and 4,335 from Porto Rico. The total enrollment was 220,940 and the schools were conducted in 2,144 school buildings. The total expenditures for educational purposes by the Department of Education amounted to $4,328,890, about one-third of the total income. In addition, $1,505,576 was disbursed by municipalities from their own funds. There are 39 private accredited schools in Porto Rico with an enrollment of 7,365 students.

The number of Porto Rican students pursuing courses in the best known colleges and universities in the United States is constantly increasing. During the year, the University of Porto Rico celebrated its twenty-fifth anniversary. Arrangements were completed for the establishment of a graduate School of Tropical Agriculture to be operated jointly by the University of Porto Rico and Cornell University and for a social-economic survey of Porto Rico by the Brookings Institution of Washington, D. C. The enrollment of students increased to 3,404, or 19%. The work of the School of Tropical Medicine, which is a part of the University, was notable. Contributions to the knowledge and treatment of tropical diseases such as sprue and uncinariasis have been made which attracted wide attention. It now has an assured place among the best schools of its class in the world.

HEALTH CONDITIONS

Health conditions continue to improve. The death rate declined from 23.3 per 1,000 population to 20.4 per 1,000 in 1927-8. This death rate is the lowest one recorded within the last thirteen years, with one exception. The serious health problems in Porto Rico are uncinariasis, tuberculosis, malaria and typhoid fever. There are 57 patients in the Leper Colony.

DISTRICT OF COLUMBIA

By Warren Reed West

Assistant Professor, George Washington University

LABOR LEGISLATION

Workmen's Compensation.—Perhaps the most important legislative developments in the District of Columbia in 1928 have been in the field of labor legislation.

The District was one of the few remaining localities without a workmen's compensation law for persons in private employment, although the matter had been before Congress for many years. Federal employees had been cared for by the Federal employes compensation law and several trades were covered in the Longshoremen's and Harbor Workers' Compensation Act of last year. Congress has now (70th Cong., Sess. I, Ch. 612) extended to other employments the provisions of the latter act. Excepted classes are: (1) a master or member of a crew of any vessel; (2) an employee of a common carrier by railroad when engaged in interstate or foreign commerce or commerce solely within the District of Columbia; (3) an employee subject to the Federal compensation act; (4) an employee engaged in agriculture, domestic service, or any employment that is casual and not in the usual course of the trade, business, occupation, or profession of the employer.

Child Labor.—The old child labor law of the District, passed in 1908, had lagged behind progress in such legislation. Attempts to bring it up to date had failed largely because the early bills had linked compulsory school attendance with child labor, and opposition to provisions affecting the latter had resulted in killing the whole program. In 1925, an act dealing with school attendance alone was passed. An act approved May 29, 1928 (70th Cong. Sess. I, Ch. 908), attempts to bring the child labor phase up-to-date. The chief changes are the following: a more adequate machinery for enforcement is set up; "poverty permits" to children between 12 and 14 for work out of school hours are done away with, though under certain circumstances boys of ten and over may distribute newspapers; a limit on the number of days work per week is fixed and this, together with the limit of hours per day and hours per week, is extended to occupations not covered by the old act; night work is restricted in more occupations; certification for employment is improved, including more adequate methods for determining age, and mandatory physical examination for minors under sixteen; employment in physically or morally hazardous occupations is restricted; and penalties are provided for violation of the street trades provision.

MISCELLANEOUS LEGISLATION

Extradition.—An act, approved April 21, 1928 (70th Cong. Sess. I, Ch. 398), attempts to relieve the situation in the District concerning fugitives from justice. Until this act came into force, it had been held in *habeas corpus* proceedings that there was no authority here to hold persons who had committed crimes in their states until extradition papers had been issued. The District had become, therefore, a kind of sanctuary for criminals pending the issuance of extradition papers in each case. It provides that, whenever any person is found in the District of Columbia charged with any offense committed in any State, Territory, or other possession of the United States, and liable under law to be delivered over to the Governor thereof, any judge of the police court of the District may, upon complaint of any credible witness, setting forth the facts, issue a warrant and, upon examination, if there is reasonable cause to believe that the complaint is true, he shall, if not charged with murder in the first degree, be placed on bond or other obligation, allowing thirty days to obtain a requisition from the governor.

Breaches of Fiduciary Obligations.—With the purpose of clarifying the legal situation concerning liability for participation in breaches of fiduciary obligations and to bring about uniformity, Congress passed an act, approved May 14, 1928 (70th Cong., Sess. I, Ch. 545). The bill was drafted by the National Conference of Commissioners on Uniform State Laws. Eleven states had adopted the proposed act before its adoption by Congress for the District. There were, in the District, no direct or controlling court decisions upon the matters affected by the present legislation. In the states, the decisions were so di-

verse as to leave much in doubt the question of the liabilities of persons dealing with fiduciaries who were guilty of breaches of duty. Some of the interpretations were such as to place responsibilities upon banks and others when practical business operations made it impracticable to fulfill them, thus placing liabilities upon those who were not guilty of dishonesty. While much of this act merely embodies the law as established in many jurisdictions, it was believed unwise to leave the matter to the hazard of judicial development in the District.

Joint Bank Accounts.—The liability of banks was still further cleared up in an act, approved May 15, 1928 (70th Cong., Sess. I, Ch. 568), which, in general, permits banks and others to pay out a joint account to any one of the persons placing the joint account; permits the surrender of the deposits in a safety box under like circumstances; and requires the bank or other institutions when holding a credit or property as garnishee, to surrender none of the credit or property held for two or more persons jointly to any such persons until the matter has been disposed of by the court.

Children's Insurance. — Fraternal benefit societies are affected by an act, approved May 29, 1928 (70th Cong. Sess. I, Ch. 862), which permits such societies to provide for insurance and annuities upon the lives of children without requiring membership in lodges or giving them a voice in the management of the associations, thus putting the fraternal societies upon a parity with stock and mutual insurance companies in this respect.

Notice to Owners.—A decision in the Court of Appeals (Wilkinson v. Dougherty et al., 56 W. L. R., 206) holding that in condemnation proceedings a notice must be given before assessing benefits upon owners even when such owners' land had not been taken, made necessary an Act (70th Cong., Sess. I, Ch. 863) providing for such notice.

SURVEY OF THE DISTRICT GOVERNMENT

The report of the subcommittee which was appointed June 30, 1926, and authorized again on December 14, 1927, to study the government of the District of Columbia, is dated May 29, 1928: a preliminary report had been made on March 4, 1927. The present report covers suggestions that the subcommittee has made to District officials for improvements in administration in taxation, assessments, printing, property control, conditions in the jail and other matters. Its recommendations include revision of the insurance code, a five-year program of expansion for the public library, placing of all positions in the municipal government, except those of the commissioners, under the civil service, and relief of congestion in the police court by the adoption of a uniform collateral-forfeiture system.

THE PHILIPPINE ISLANDS

By Frank McIntyre

Chief, Bureau of Insular Affairs, War Department

General Conditions.—The year has been an excellent one for the Philippine people and government. Progress has continued in all fields. Public order was excellent and health conditions good. The Acting Governor General reported on February 28, 1928: "It would be difficult to find a more contented body of people or one with fewer causes for grievances."

GOVERNMENT POLICIES AND ACTS

Stimson Policy of Coöperation.—Governor General Stimson, beginning with his inaugural address on March 1, 1928, initiated a policy of sympathetic coöperation with the Philippine people and has since succeeded in bringing about several important steps to carry out this program. He appointed his cabinet after

conference with the leaders of the majority in the Legislature, and he created a Council of State to advise him on matters of public policy, the membership consisting of the President of the Senate, the Speaker of the House of Representatives, the majority floor leaders of the Senate and of the House, and the heads of the six executive departments.

Legislation.—As showing the response of the Philippine Legislature to the Governor General's suggestions, the first bill it passed during the present session was one providing sufficient funds to enable the Governor General to employ advisers to assist him. It has since amended the rules of procedure of both houses of the Legislature giving to members of the cabinet the privilege of the floor of both houses with the right to speak on subjects relating to their departments and the duty, under proper safeguards, of submitting to interrogation thereon, and has passed a bill creating ten additional Auxiliary Judges of the Court of First Instance. These Judges will be assigned to hear and decide only land registration and cadastral cases and will reduce the delays in obtaining titles to public lands. This is the first of the legislative steps taken on the Governor General's recommendation for the purpose of improving the situation with respect to the distribution of the public lands of the Philippine Islands among applicants for homesteads.

Friar lands bought by the Philippine Government over twenty years ago for sale to their occupants have now been practically all disposed of, except the more remote and forested areas.

The Board of Control case (AMERICAN YEAR BOOK, 1927, page 143) was appealed to the Supreme Court of the United States, which in May, 1928, affirmed the decision of the Philippine Supreme Court, sustaining the position of the Governor General and seating the directors of the government-owned companies elected by him.

Civil Service.—There were 484 Americans and 19,165 Filipinos permanently employed in the civil service on December 31, 1927. The appointment of Americans in the Philippine civil service, except for teachers of secondary English and a few persons with special technical qualifications and experience, has practically ceased.

Wood Services.—Impressive memorial services for the late Governor General Leonard Wood were held on the first anniversary of his death, August 7, 1928.

FINANCIAL AND ECONOMIC CONDITIONS

Finances.—The finances are in excellent condition, largely due to the greater agricultural production of the Islands and the sale in the United States of government bonds for public works. The sound finances were reflected in the increased currency circulation and satisfactory banking situation. The currency circulation of the Islands on December 31, 1927, was $63,500,000, an increase of more than $1,900,000 over the figures of the preceding year. The general banking condition showed marked improvement during the year 1927. The total resources and liabilities of all banks and trust companies doing business during the year increased almost $5,500,000 as compared with the previous year, while their reserves increased by nearly $5,000,000. The net bonded indebtedness of the Philippine Government on December 31, 1927, amounted to $83,992,500, of which $74,800,000 are obligations of the Insular Government proper, and the balance of $9,192,500 are obligations of the Provincial and Municipal Governments.

Business Volume and Production.—The economic and business conditions of the country in 1927 were practically the same as those prevailing in 1926. The volume of business in 1927 exceeded that of 1926 by a wide margin, but because of the general decrease in prices of commodities there was only a slight increase in the total value of business over that of 1926. With the exception of abacà and maguey, practically all the important agricultural products of the Philippines show increases in production. Coconut oil, copra, desic-

cated coconut and copra meal showed most encouraging increases in value, as has been the case for the past few years. The Acting Governor General, early in 1928, thought it probable that the products of the coconut tree would in the near future become the leading export crop in the Philippines.

Trade Items.—The total trade of the Philippine Islands for 1927 amounted to approximately $271,500,000, as against $256,000,000 in 1926, an increase of over 6%. Of this total, 69.09% was with the United States, an increase of American participation of about 9½% over 1926. Japan ranked next to the United States in total volume of trade, handling approximately 7% of the total, followed by Great Britain with approximately 5%. Approximately 49% of the value of the trade in the Philippines was carried by American vessels, as against 47% in 1926. 30% was carried by British vessels as against 29% in 1926.

Imports into the Islands dropped from $119,000,000 in 1926 to $115,500,000. The significant feature of the imports was the heavy decline in the importation of rice. The value of this commodity imported dropped from $4,500,000 in 1926 to $1,000,000 in 1927. This is an important item in the development of the Philippine Islands. In 1903, 30% of the imports into the Philippine Islands, in value, consisted of rice; in 1927, but 1% consisted of rice.

Investment Capital.—The lack of investment of outside capital is still the cause of the slow economic development. This is fully appreciated by Governor General Stimson, who, in his inaugural address, pointed out the importance of greater economic development of the Islands and the necessity for encouraging the entry of American capital for that purpose. Believing that to be the fundamental problem of the Philippine Islands today, one of the first steps he took was to cause an investigation and survey to be made of the economic conditions of the Islands by an experienced authority from the United States, Lyman P. Hammond.

Proposed Law Changes.—Based on Mr. Hammond's report and on his own observations, Governor General Stimson, in his message to the Philippine Legislature at the opening of the annual session on July 16, 1928, recommended a revision of the corporation law, the public utilities law, and the land law, and amendments of these laws are under consideration by the Philippine Legislature.

EDUCATION

Enrollment.—The general interest of the people in educational progress is still maintained. For the first time in five years, the annual enrollment of pupils in the public schools under the control of the Bureau of Education has increased. The enrollment in 1927 was 1,099,127 as compared with 1,061,525 in 1926. While the total annual enrollment is increased, there has been in the last five years a discouraging decrease in the enrollment of non-Christian pupils, due, in part, to a disinclination on the part of the non-Christian parents, especially Moros, to send their children voluntarily to school, and also to a suspension, for reasons of governmental policy, of the application of the compulsory school law. There were 25,965 teachers employed in 1927, as against 25,322 in 1926. As in 1926, the number of American teachers was only 294. An investigation made of the educational qualifications of Filipino teachers showed that a marked improvement has been made in this respect during the past few years.

Expenditure.—The amount spent for education was greater in 1927 than in 1926. There was a decided increase in the Provincial Government expenditures for school purposes. Enrollment in the recognized private schools decreased from 88,001 for the 1926-7 school year to 86,695, the decrease being due to the fact that in 1927 a considerable number of private schools lost their governmental recognition. During the same period, the number of teachers in these private schools increased from 3,523 to 3,916, probably due to the campaign of the Bureau of Education against the unusually heavy teaching loads to which

private school teachers have been assigned in the past.

Appropriations.—The Bureau of Education is still confronted with the problem of providing schools and teachers for approximately two million children not yet receiving an elementary education. Large additional appropriations are necessary for school buildings, more and better equipment, and more and better-trained and better-paid teachers.

HEALTH CONDITIONS

Death Rate.—The general health conditions during the year were good. The death rate in Manila was 24.21 as compared with 26.37 in 1926, and in the provinces, 20.65 in 1927 as compared with 21.75 in 1926. This reduction was due to the fact that the diseases which were prevalent in 1926, such as cholera, influenza, measles, etc., did not prevail in 1927. Cholera never appeared as an epidemic in 1927. There were 8 cases, with 4 deaths, in the provinces, and 3 cases, all cured, in the city of Manila. Only one case of smallpox was reported. Although there were mild outbreaks of dysentery in several provinces and in Manila, none of them had any serious consequences. With the aid of the new anti-dysentery vaccine they were soon put under control. The typhoid fever situation in the Islands showed no material change during the year from that of the year before, the slight increase in the incidence in Manila having been probably due, in part, to a smaller number of anti-typhoid inoculations in 1926. Infant mortality in Manila was reduced from 166.27 to 150.33 per thousand, showing a notable improvement in this feature of the health work.

Leprosy.—There are 6,394 lepers under confinement:—5,181 in the Culion Leper Colony, 495 in San Lazaro Hospital, 270 in the Cebu Detention Camp and 448 in other detention camps. As a part of the plan of establishing leprosy treatment stations in different parts of the Islands, an officer of the Philippine Health Service was sent to India to study in the various skin clinics, particularly in the diagnosis of incipient leprosy. He returned early in 1927 and opened a skin clinic in Cebu. It is gratifying to note that since its establishment early cases have presented themselves voluntarily for treatment in an increasing number. In the early part of the year, the Bureau of Health started a campaign for the construction of detention camps for the accommodation, care and treatment of lepers awaiting transportation to Culion. All lepers isolated in detention camps were given anti-leprotic treatment twice a week. During the year, 21 lepers were discharged.

Malaria.—In the years 1925 and 1926, more than 24,000 deaths were reported to have been caused by malaria, and special attention has been given this year to its control. A Malaria Advisory Committee was appointed by the Governor General to assist and advise the Secretary, under whose Department is the Health Service, relative to research and control of malarial fever in the Philippine Islands. The malaria control activities initiated by the Rockefeller Foundation in 1922 were taken over in 1927 by the Philippine Health Service. The control measures, already demonstrated to be so effective and economical, were extended to other provinces in the Islands. Demonstrations proved that the use of Paris green is the only feasible and economical method of killing larvæ of the mosquito which transmits malarial fever in the Philippine Islands.

VIRGIN ISLANDS, GUAM AND AMERICAN SAMOA

By W. R. Furlong

Captain, U.S.N.; Office of Naval Intelligence, Navy Department

VIRGIN ISLANDS

Governor.—Capt. Waldo Evans, U.S.N., retired, appointed March 1, 1927.

The population of the Virgin Islands in 1901 was 30,527; in 1917, when the islands were acquired by the United States Government, the population had fallen to 26,051; in 1927 it was 20,728. The reduction is due to emigration to the continental United States, as is shown by the death rate per thousand in 1917 of 41.5; in 1927 of 22.8.

Production.—During the fiscal year ended June 30, 1928, 91,628 gallons of bay rum produced in the island of Saint Thomas were sold and exported. and 145,296 gallons of alcohol were produced in Saint Croix during the same fiscal year. Approximately 10,000 tons of sugar were exported from Saint Croix during the same period. During the fiscal year 1927, 746 head of cattle were exported from Saint Thomas and 1,263 from Saint Croix. During the fiscal year 1926 the value of importations into the Virgin Islands was $2,531,404.

Shipping and Banking.—A total of six hundred and one ships entered the harbor of Saint Thomas, the greatest number recorded since the transfer, with the exception of the year 1920. Bank statistics show a large increase in savings. The sale of postage stamps at the Post Office in Saint Thomas far exceeded the sales in any year since the transfer of the islands.

Hurricane Damage.—A hurricane of large area with wind velocity of one hundred miles per hour passed over the Virgin Islands on September 13, 1928, doing much damage in Saint Thomas to seawalls and waterfront. Many trees were blown down and some houses damaged, but there was no loss of life or serious injuries. Buildings at the Naval Station were badly damaged and considerable damage was also done to naval boats. In Saint Croix the hurricane caused six deaths and great property damage, reaching at least $400,000.00, which, owing to the financial condition of people, they cannot repair. Outside aid will be necessary. The Marine Barracks at Saint Croix were damaged to the extent of $25,000.

Lindbergh's Flight. — Colonel Charles A. Lindbergh, in his historic plane, the *Spirit of Saint Louis*, en route home from his Mexican and Central American good-will flight, left Maracay, Venezuela, January 31, 1928, for a non-stop flight to Saint Thomas, via the Lesser Antilles, and arrived at the flying field in Saint Thomas at 4.50 P. M., having covered a distance of one thousand miles in ten hours and fifteen minutes. During his stay in Saint Thomas Col. Lindbergh was the guest of the Governor at Government House. The day following his arrival was proclaimed a public holiday and elaborate festivities were arranged as a celebration in his honor.

Revenue.—The Virgin Islands are not self-supporting, and in order to maintain the standards which have been set since the transfer of the islands to the United States, it is necessary for the local Colonial Councils to enact budgets considerably in excess of the local revenues, the deficits being made up from the Congressional Appropriation. The Government of the Islands faces a reduction in revenue during the fiscal year 1930 as a result of the expected reduced sugar production.

Municipal Finance.—The creation of Finance Departments in the two Municipalities and their successful operation during the year has placed the business of the Government on a firm and well-organized basis. Competition in purchasing has been enlarged, taxes and other revenues have been collected in a systematized manner and expenditures have more closely come under those responsible

for the economic administration of the Government. Savings were placed into much needed permanent improvements like public buildings and highways.

Health.—The Chief Sanitation Officer in Saint Thomas reports that during the past year the health of the district under the jurisdiction of the Sanitation Service has been excellent. Preventive measures have been continued with satisfactory results. Mosquito breeding has been prevented as far as possible, and the usual inspections of milk, water and cattle have been made as in former years. At the Municipal Hospital in Frederiksted a most helpful improvement was effected when the hospital was connected to the Creque Dam, insuring in this way a constant supply of water.

In Saint Croix, energetic measures have been carried out to combat the spread of the hookworm disease from incoming Porto Ricans, to which about 30% of all Porto Ricans examined are subject. In addition to these measures, all of the villages inhabited by Porto Ricans have been furnished with adequate latrines.

On June 30, 1928, there were eighty-three patients in the Leper Asylum in Saint Croix, and forty-three patients in the Insane Asylum. In order to furnish the inmates of the Insane Asylum with a more varied diet, a plot of land on the asylum reservation had been prepared and will be planted to vegetables.

The cattle industry in the three islands gives prospect of becoming a major industry in the not too distant future. A graduate veterinarian is much needed for duty in the Virgin Islands and inspection for the detection of tuberculosis in dairy cattle. The United States Department of Agriculture should assign such an official to duty in the Agricultural Experiment Station of the Virgin Islands.

Education.—The school attendance during the fiscal year 1928 was 2,919 as compared with 3,083 during the fiscal year 1927. A total of $94,338.40 was made available for the maintenance of the Department of Education during the year, or an average cost, per pupil, of $32.32.

The Supervisor of Agriculture has recorded marked improvement in agricultural education during the past year. Five shipments of tomatoes, raised by the public schools in Saint Thomas, were made to the United States, the first on December 8, 1927, and the last on January 15, 1928.

Water Supply.—In the island of Saint Thomas, four public water-supply units, previously erected by the generosity of Congress, were in operation during the year, and approximately 3,600,000 gallons of water were supplied to the populace without charge. The importance of this supply is emphasized by comparison with the total capacity of private cisterns in the city of Saint Thomas, which is estimated at 5,000,000 gallons. The availability of this water from the public supply has, therefore, alleviated what would otherwise have been a serious condition of distress amongst the poorer classes of people in Saint Thomas.

Scarcity of water is the most conspicuous natural deficiency in the Virgin Islands. Although each of the three towns has been provided, since the transfer of the islands to the United States, with a public domestic water supply which is sufficiently extensive to preclude suffering during extreme drought, yet the sugar planters in Saint Croix, and to some degree the cattle rangers, are handicapped in their cultivation by shortage of water. Consideration has been given to the feasibility of impounding surface drainage or by deep-well exploration. Dams and other works for impounding and distributing surface drainage would be applicable only to a portion of the cane lands and the cost would be greater than the result would justify.

In Frederiksted, Saint Croix, a distributing system for the Creque Dam was completed and connected to the Frederiksted Municipal Hospital Since February, water has been issued to the public from hydrants in the town. The severe and prolonged drought during these months has made the situation acute and the

water supply system is now performing its function as a reserve supply with complete relief to the people of the town.

Libraries.—The trustees of the Carnegie Corporation of New York have recently expressed a willingness to appropriate the sum of ten thousand dollars in support of the Virgin Islands' Public Libraries, payable five thousand dollars annually for two years, beginning October 1, 1928.

Shipping.—The fiscal year 1928 was a most successful year for the harbor of Saint Thomas. A total of six hundred and one ships, with a gross tonnage of 2,536,729, visited the port of Saint Thomas during the year. $15,687.50 were collected in pilotage fees during the fiscal year as compared with $9,703.00 during the previous fiscal year.

A proposal is pending for dredging the harbor of Saint Thomas to a uniform depth of about thirty feet.

Sugar.—The sugar crop was the largest for several years due, in a large measure, to increased rainfall during the spring of 1927. The price of sugar has varied from a low of about $4.21 per hundred pounds to a high of about $4.65 per hundred pounds delivered in New York. Rainfall is the main contributing factor in the Saint Croix sugar crop, which has been very low for the last six months. Because of the large crop of sugar just harvested, the reduction of the sugar tax from eight dollars to six dollars per ton will not be very noticeable until the fiscal year 1930. Further reduction of the export duty on sugar would require increased local taxation. The production of sugar in Saint Croix is the major industry of the Virgin Islands and should logically be one of the major sources of local revenue. The recent sale of the Saint Croix sugar factory to Bethlehem (The West Indian Sugar Factory) is evidence of optimism for the future of the sugar industry and, while fostered by the generosity of Congress in reducing the sugar export tax, it also gives evidence of an improvement in the labor market, heretofore not completely adequate.

GUAM

Governor.—The present Governor is Captain L. S. Shapley, U.S.N., Retired. The seat of the island government is in the city of Agana.

Health.—For the fiscal year 1928, the U. S. Government appropriated $18,000 for care of sick and maintenance of lepers. There are no civilian physicians or hospitals here nor could the population maintain them, and the natives, numbering about 16,000, are, with few exceptions, dependent for prevention of disease and for medical care upon the Federal Government. Upon this aid depends the nursing, provisions, and maintenance of hospital facilities for the sick of the island population, who are wards of the Government, and the care of lepers and insane from this island, who have been sent to Culion Leper Colony and San Lazaro Hospital, P. I. The whole island population is benefited by the sanitary instruction, training of nurses, and detection and isolation of infectious diseases.

Education.—In 1928 the U. S. Government appropriated $12,000 for education. The schools have a registration of about 3300. The age for compulsory attendance at schools is between seven and twelve years, but under-age children also attend school, and many children continue their schooling after reaching twelve.

The most important phase of the educational work in Guam is the teaching of English. There are 126 teachers employed, of whom 10 are Americans and 116 natives. During vacation months all the teachers attend normal school where the native teachers are instructed in correct English, and proper teaching methods by American teachers.

Agriculture.—The main occupation of the natives of Guam is agriculture, nearly every family owning and cultivating small ranches which supply their principal necessities of food. The principal crop of the island and practically the only item of export is copra, which is the dried meat of the cocoanut. During the year 1927, the value of copra and cocoanut oil products exported from Guam

amounted to about $88,000. Imports into Guam for 1927 were valued at $415,936.42, and exports at $88,367.57.

AMERICAN SAMOA

Governor.—Captain Stephen V. Graham, U.S.N., has been Governor of American Samao since his appointment on Sept. 9, 1927.

Population.—The population of American Samoa on June 30, 1927, was 8730 and on June 30, 1928, it was 8940, showing an increase of 210. This includes 1223 in the Island of Ta'u and 872 in the Islands of Ofu and Olesega. The present population of Swain's Island (Gente Hermosa) is 83.

Food products are plentiful. The copra production has been as follows: for 1925, 1315 tons, $139,369.44; for 1926, 590 tons, $63,714.19; for 1927, 551½ tons, $52,834.55; and for 1928, the indications are that the crop is going to far exceed that which was shipped the year preceding the hurricane of 1926 and possibly be the largest crop ever shipped from American Samoa. Certainly the quality of copra now being shipped excels any ever shipped out of American Samoa. More cocoanut trees are being planted regularly, particularly in the Manua District. The subject of taxes and that of copra production go hand in hand as practically all the money with which natives' taxes are paid is derived from the sale of copra. The natives' taxes for this year amounted to $28,685.10.

Revenue.—The Customs Department revenues from all sources for the year 1916-1927 was $57,973.58; and for the year 1927-1928, $72,833.43. The value of merchandise on which duty had been collected, excepting parcel post, during the fiscal year 1927-1928 is as follows: from United States, $81,959.00; from Australia, $60,069.00; from Germany, $6,924.00; from Japan, $849.00; from France, $90.00; from all other countries, $17,173.00, making altogether a total of $167,064.00.

Education.—The present teaching staff consists of forty-eight, of whom forty-two are Samoans and six are white. There are nineteen schools in the public school system and they are so located as to have a school within reasonable walking distance of every child in American Samoa. The enrollment is 1900 pupils. This is the largest enrollment in the history of the public school system. There are 372 pupils enrolled in the six private schools, making the total number of 2272 children enrolled in all the schools of American Samoa. Only Poyer and Tau schools are equipped with patented desks. As Samoans sit upon the floor at home, the lack of desks in the schools causes no great inconvenience. Poyer is the largest and best school in the islands. The most of the island teachers are educated in this school. Fifty-five teachers and candidate teachers attended the normal school at Poyer this year. All necessary equipment and supplies have been furnished the schools.

Seven of the schools are housed in American buildings and twelve in Samoan fales. Thirteen of the schools have plantations. Manual training is taught in two schools; sewing is taught in four of the schools. The sum of $20,588.00 was allotted to the Department of Education for the year 1927.

Health.—The senior medical officer of the U. S. Naval Station, Tutuila, Samoa, is the health officer. He has the title, Public Health Officer of American Samoa. The appointment is made by the Governor of American Samoa. There are two other medical officers, a dental officer, a pharmacist, and four members of the Navy Nurse Corps attached to the naval station. All hold positions in this department of the Island Government.

The duties of hospital corpsmen attached to the naval station are largely as members of the health department, serving either at the Samoan hospital, a purely civil institution, or in one of the several public health districts, far from the naval station. About $12,000 is allotted by the Bureau of Medicine and Surgery of the Navy for medical and surgical supplies for the Samoan people. The annual appropriation by the Government of American Samoa for operation of the Health Department

amounted to $10,161.00 for the calendar year 1928.

High praise should be given to the medical officers and chief nurses who have served in Samoa in past years for the rapid growth of the hospital and training school for nurses. The first class, consisting of 3 members, graduated in 1916 after a two years course of training. The training period was increased to three years in 1921. To date, 34 nurses have graduated.

The total number of patients who received treatment at all clinics conducted by the Health Department of American Samoa during the fiscal year ended June 30, 1928, was 49,388, making an average of 135 per day. The total attendance figure also gives an average of 5.6 visits to clinics for every man, woman, and child in the islands.

Highways.—In accordance with resolutions passed at the Annual Fono and approved by the Governor, the former practice of requiring the natives of various communities to furnish labor on roads has been discontinued. The new section of public highway from Leone to Seetaga was opened with appropriate ceremony on November 2, 1927. This highway is now completed to Amanave. In accordance with a resolution passed at the Annual Fono and approved by the Governor, an appropriation was made for the extension of the eastern highway from Fagaitua to Alofau. The present condition of the roads, taken as a whole, is better than it ever has been in the history of American Samoa. The total expended by the Public Works Department was $31,346.11.

Telephones and Radio.—During the past fiscal year telephones were installed at Leone and Amouli. In addition to the main radio station at Tutuila, there is a radio station on the Island of Tau and one on the Island of Ofu.

MARITIME JURISDICTION

By Charles E. Hill

Professor, George Washington University

Protection of Halibut in the Pacific.—The treaty entered into between the United States and Canada in October, 1924, is of particular interest for three reasons: it is the first treaty negotiated by Canada as a nation; it is the first effective treaty anywhere having for its object the protection of a threatened high seas fishery, that of halibut. The International Fisheries Commission provided for by the treaty has this year made its first report. The treaty stipulates that there shall be a closed season of three months for halibut. The Commission finds that no real protection is furnished thereby, because the halibut is caught in greater numbers during the open season. Instead of the closed season, the Commission recommends that the taking of halibut be limited to a fixed amount until the supply has recuperated. It is further recommended that two closed nursery areas be established with an area of at least one hundred square miles in the aggregate. One area is to be near Cape Addington, Alaska; the other is to be off Massett Graham Island, British Columbia. The Commission is keeping accurate records upon which to base carefully drawn conclusions in the future.

Territorial Waters.—On the initiative of the faculty of the Harvard Law School, with aid from the Commonwealth Fund, a committee has been formed to study the subject of territorial waters. Professor George Grafton Wilson of Harvard is the reporter for the committee. Among the members are Professor Philip M. Brown of Princeton, Professor Edwin Dickenson of the University of Michigan, Professor P. C. Jessup of Columbia and Mr. George W. Wickersham of New York. Professor Manley O.

Hudson of the Harvard Law School is the director of research. The best book on this subject is that of Professor Philip C. Jessup, *The Law of Territorial Waters and Maritime Jurisdiction* (G. A. Jennings Company, 1927).

Liquor Convention with Japan.—During the summer, a liquor convention with Japan was negotiated in addition to the similar conventions already made with a dozen other powers. The terms are largely the same as those of the convention with Great Britain in 1924. The principle of the three-mile limit for territorial waters is affirmed. Japanese vessels may enter American jurisdiction and carry liquor as stores or as cargo destined for a non-American port provided that such liquors shall be kept under seal continuously while within American jurisdiction. Japan agrees that she will raise no objection to the boarding and (on probable cause) the searching of her private vessels within an hour's run from the American shore, the purpose being to allow American officers to ascertain whether there is liquor on board destined for the United States in violation of law. If there is reasonable ground for suspicion, the vessel may be taken into the United States district court for adjudication.

Twelve-Mile Limit.—The question for decision in the *Pescawha*, 19 Fed. (2nd) 506, was whether a foreign vessel engaged in smuggling or attempting to smuggle into the United States intoxicating liquors, if discovered within twelve miles of the coast, might be pursued and seized beyond the twelve-mile limit and the vessel and her cargo forfeited. It was held that intoxicating liquor is merchandise within the law requiring that a vessel, bound for the United States, should have the liquor listed on its manifest. Even though the vessel may not touch the American shore, but delivers its cargo of liquor within the twelve-mile limit to another boat for the purpose of having it carried to a port, the transaction comes within the provisions of the Tariff Act of 1922. The officers and crew of the vessel may be criminally liable: the vessel and the cargo may be forfeited.

Bound to the U. S.—In the *Mistinguette*, United States Circuit Court of Appeals for the Second Circuit, Judge Swan interpreted the clause "bound to the United States." This fact is to be determined not necessarily by the clearance papers but by the actual conduct of the vessel. It is unnecessary for the vessel to enter a port of the United States. If the evidence shows that it was placing or intended to place its cargo into the United States by delivery at sea within the twelve-mile limit, this clause should be interpreted as applicable.

Hot Pursuit.—In the *Vinces*, a British vessel, 27 Fed. (2nd) 296, the Circuit Court of Appeals, Fourth Circuit, upheld the doctrine of "hot pursuit." The vessel was hailed within the twelve-mile limit, pursued and seized beyond and also beyond the hour's run from shore as provided in the treaty with Great Britain.

Doctrine of Protection from Injury.—The Circuit Court reasserted the doctrine of extra-territorial jurisdiction over the high seas announced by Chief Justice Marshall in Church *v.* Hubbart, 2 Cranch 187: "The authority of a nation, within its own territory, is absolute and exclusive. . . . But its power to secure itself from injury may certainly be exercised beyond the limits of its territory. . . . Any attempt to violate the laws made to protect this right is an injury to itself, which it may prevent, and it has a right to use the means necessary for its prevention. These means do not appear to be limited within any certain marked boundaries, which remain the same at all times and in all situations. If they are such as unnecessarily to vex and harass foreign lawful commerce, foreign nations will resist their exercise. If they are such as are reasonable and necessary to secure their laws from violation, they will be submitted to."

SPHERES OF AMERICAN INFLUENCE

By Roy Malcom

Professor, University of Southern California

NICARAGUA

Secretary Kellogg's Position.—Interest in the Caribbean in 1928 has centered largely in Nicaragua because of the proposed plans of the United States to supervise the elections. These plans met with considerable opposition here as well as in Nicaragua. Late in 1927, in answer to inquiries concerning the forthcoming election, Secretary of State Kellogg issued a statement of our position as follows: "The United States is not going to select any candidate for the President of Nicaragua, either Conservative or Liberal. Neither is the United States going to back or use its influence for the election of any particular person." He pointed out that following the Constitution of Nicaragua and the treaty, the United States could not recognize anybody not qualified under the constitution to hold that office. "The question," he added, "of General José Moncada's eligibility for the Nicaraguan Presidency has never been raised, and so far as I know he is not disqualified under the Constitution of Nicaragua or the Central American Treaty."

Revolution and Politics.—In November, 1927, local and municipal elections were held in Nicaragua and were supervised by United States Marines and the National Guard. The Liberals were victorious. In the closing months of 1927, a number of engagements took place between the American Marines and the Nicaraguan Constabulary, on the one hand, and the rebel forces under Generals Sandino and Salgado, on the other hand. Henry L. Stimson, the personal representative of President Coolidge, had stated early in the summer of 1927 that the organized revolution in Nicaragua was over, but a Washington dispatch stated that subsequently some 540 Nicaraguans were killed in engagements with United States Marines.

Financial Survey.—In the closing weeks of 1927, it was announced from Washington that Dr. W. W. Cumberland, formerly financial adviser to the Government of Haiti, had been selected by the United States, with the approval of both political parties in Nicaragua, "to make a financial and economic survey of Nicaragua and to investigate the country's resources and requirements, in order that the Nicaraguan Government and the Department of State may have the benefit of his recommendations regarding the advisability of a loan to provide an additional revenue for the payment of claims arising out of the recent revolution, for establishing and maintaining an efficient national guard to preserve order in the country, for the expenses of holding Presidential elections next year, for the construction of the long contemplated and apparently much needed railway between the capital and the Atlantic coast, and for other public works."

U. S. Program Criticized.—It was announced in Washington on January 3 that orders had been issued for the immediate dispatch of 1,000 additional marines to Nicaragua. A total of 1,400 enlisted men and 80 officers had been maintained in Nicaragua since August, 1927. Hostilities were carried over into the new year. The American program, including the plan to supervise the 1928 fall elections, was widely criticized by the press of the United States, Europe and Latin America. Demands were made in the Pan-American Conference for discussion of the problem. In Congress, the Coolidge policy was criticized by members of both parties. The situation in Nicaragua was referred to as "the state of war illegally declared in Nicaragua." Finally, the Foreign Relations Committee of the Senate announced February 8 its intention of launching a thorough investigation of the situation.

Kellogg Position in Elections.—On February 23, Secretary Kellogg issued

a statement which stated clearly our position in the supervision of elections: "In view of numerous rumors," said he, "and newspaper articles, evidently of a propagandist nature, which have come to my attention, I desire once more to state with the utmost emphasis that the United States is maintaining and will continue to maintain an attitude of absolute impartiality in all matters relating to the forthcoming Nicaraguan elections. The United States will favor neither any candidate nor any party in that election. All of its representatives in Nicaragua have been definitely instructed in that sense from the beginning, and this government knows of no violation whatever of those instructions. Naturally, we cannot accept any responsibility for rumors and newspaper articles of the character referred to."

U. S. Supervision Decreed.—On March 31, President Diaz signed a decree which provided that the National Board of Elections should have "full and general authority to supervise the elections of 1928 for the Supreme Authorities and to prescribe, with obligatory force, all measures necessary for the registration of voters, for the casting and counting of ballots and regarding all other matters that may pertain to the election." General Frank R. McCoy, U.S.A., as chairman of the National Board of Elections, was given plenary powers, even to the extent of calling upon the services of the National Constabulary to guarantee a free and impartial election. It was announced in the fall that the following measures were adopted by the National Elections Board as a means of guaranteeing order and fairness at the Presidential election to be held on November 4: an American official was to be present at each of the 351 polling booths; Americans were to count the votes; and strong detachments of the Nicaragua National Guard, under the command of American officers, were to be stationed at each of the polling places; the National Guard was to police the entire country until after the election, displacing all local police. In September, the National Elections Board placed all liquor warehouses under lock and seal. Every precaution was taken to prevent fraud at the polls.

Election Results.—The American Electoral Mission in Nicaragua was assisted by an advisory board composed of Dr. Harold W. Dodds of Princeton University, G. K. Pond, Massachusetts State Senator, and Walter Wilgus. Under the supervision of General McCoy, 145,000 Nicaraguans registered for the elections to be held on November 4. General José Mariá Moncada, Liberal, was elected to the Presidency for the four year term beginning January 1, 1929. General McCoy carried out the general provisions of the Stimson peace terms as agreed upon in 1927. Utmost pains were taken to insure a fair and honest election. Some 7,000 United States marines and bluejackets policed the country, aided by the Nicaraguan National Guard. In addition, about twenty airplanes were used to supplement the work of the military forces. It was said to be the fairest election in Nicaraguan history.

CUBA

Postal Transit.—Since 1920, the United States and Cuba had engaged in a controversy over postal transit charges between the United States and Cuba: Postmaster-General New announced late in 1927 that this controversy had been settled upon a mutually satisfactory basis.

Havana Pan-American Conference.—There was widespread interest in the Havana Conference which opened at Havana on January 16. This interest was intensified by the fact that the United States was in Nicaragua in a military way. Charles Evans Hughes, heading the United States delegation, addressed the American Chamber of Commerce on questions in relation to the position of the United States in the Caribbean. He said: "Pan-Americanism rests upon four pillars. The first is independence: it is the firm policy of the United States to respect the territorial integrity of the American republics. We have no policy of aggression. We wish for all of them, not simply those

great in area and population and wealth, but for every one, to the very smallest, strength and not weakness. What a fatuous idea it would be to think that the United States desired that any of these states should be weak or the prey of disorder. . . . The second pillar of Pan-Americanism is stability. Independence is not enough. Independence gives opportunity, but stability is essential to take advantage of it. It is our desire to encourage stability in the interest of independence." By way of illustration, Mr. Hughes cited American intervention in Santo Domingo and continued: "We would leave Haiti at any time that we had reasonable expectations of stability and could be assured that withdrawal would not be the occasion for a recurrence of bloodshed. Meanwhile, we are endeavoring in every important direction to assist in the establishment of conditions for stability and prosperity, not that we may stay in Haiti, but that we may get out at the earliest opportunity. We are at this moment in Nicaragua, but what we are doing there and the commitments we have made are at the request of both parties and in the interest of peace and order and a fair election. We have no desire to stay."

Spanish War Veterans Convention.—A touch of sentiment was given to Cuban-American relations when in Havana on October 8 Cuban and American veterans of the War of 1898 united in a reunion at the opening of the thirtieth annual convention of the United Spanish War Veterans. In an address delivered at this convention, President Machado asserted that Cuba would welcome the repeal of the Platt Amendment, which authorizes the supervision of Cuba by the United States. The President pointed out that Cuba enjoys complete sovereignty and that there is no longer any moral basis for the Platt Amendment.

PANAMA

Treaty with U. S. Rejected.—It was announced in January by Dr. Ricardo J. Alfaro, Minister of Panama to the United States, that the government of his country could not accept the treaty of alliance and amity signed by the United States on July 28, 1926. Panamanian opposition to the treaty centered around Article XI of the treaty, particularly that section which provides that "the Republic of Panama will consider itself in a state of war in case of any war in which the United States should be a belligerent." This was held to conflict with the responsibilities of Panama as a member of the League of Nations.

Election Supervision Declined.—In June, there was quite a stir in political circles in connection with the campaign for the Presidency. The American State Department had announced in January that the United States would not supervise elections in Panama, a request made by Dr. Belisario Porras, former President of Panama. The United States nevertheless was accused of certain favoritism but this was denied by American Minister J. G. South. One of the local papers, *El Heraldo*, stated that "intervention by the United States in the forthcoming elections would be imperative and that similar intervention would be necessary for the next twenty years." Secretary of State Kellogg saw no particular reason for American intervention in the Presidential election held on August 5. He intimated, however, that if a revolution should follow the election "the United States would be compelled to exercise the power granted under the treaty and constitution to maintain order."

HAITI

Arthur C. Millspaugh, formerly financial adviser to the Persian Government, was selected, with the approval of President Borno of Haiti, to succeed W. W. Cumberland as financial adviser to the Government of Haiti. In April, the American State Department issued the Annual Report of the Financial Adviser-General Receiver for the fiscal year October, 1926—September, 1927. In the report, Mr. Cumberland stated: "Prospects for 1927-1928 are favorable. Haitian finances may be regarded as definitely

established 'on a firm and solid basis' as contemplated in the treaty, and principal attention now needs to be directed toward developing the economic resources of the country and to advancing the educational standards of the population."

LINDBERGH'S FLIGHT

A touch of the heroic was added to our relations with Central America and the Caribbean when Col. Charles Lindbergh, in December, 1927, and January, 1928, extended his good-will tour from Mexico into the Central American countries. He touched at Guatemala City; Belise in British Honduras; San Salvador, Honduras; Managua, Nicaragua; Costa Rica, and finally Panama. He was greeted everywhere as a messenger of goodwill. From Panama he flew to Colombia, Venezuela, Virgin Islands, Porto Rico, Dominican Republic, Haiti, and Cuba. On February 8, he reached Havana, making a total of 7,680 miles covered since the beginning of the trip.

PART THREE
GOVERNMENTAL FUNCTIONS

DIVISION VII
PUBLIC FINANCE AND TAXATION

NATIONAL EXPENDITURES AND REVENUES

By Merlin H. Hunter

Professor, University of Illinois

TREND OF FEDERAL EXPENDITURES

Economy and Dollar Value.—Much emphasis has been placed upon economy in administering the Federal finances, and undoubtedly the administration is now upon a more businesslike basis than ever before. Because of this, the conclusion is justified that the citizens are getting more for their tax dollar, the change in the value of money not considered, than ever before. It does not mean, however, that Federal expenditures may be expected to decrease. In fact, it seems that the former hopes of the officials to reach a $3,000,000,000 budget have been abandoned. Not only have they ceased to discuss this possibility, but the total of expenditures seems to be on the increase. In fact, the total expenditures are now more nearly $4,000,000,000 than $3,000,000,000.

Changing Factors.—In Federal expenditures there is noticed a decrease in the sums demanded because of the World War but these decreases have been more than offset by increases for civil purposes. The payments made in the national debt have lessened the annual interest charge, while the cost of caring for veterans and disabled soldiers may be expected to continue to decrease. The government continually enters new fields of civil activities, and has given larger and larger amounts in aid to the states, all of which help to account for the increase. As yet, however, only a comparatively small percentage of the total expenditure is for strictly civil affairs.

Budget Director's Report.—The annual reports of the Director of the Budget set forth an analysis of the expenditures and revenues of the Federal Government. A study of the following statistics, taken from the seventh annual report of the Director of the Budget, will reveal the relative importance of different items of expenditure and revenue.

ESTIMATES, APPROPRIATIONS, RECEIPTS, AND EXPENDITURES (FISCAL YEAR 1928)

(Exclusive of postal revenue and expenditures)

Estimates of appropriations:	
Budget for 1928 (including revised public-debt estimates)	$3,195,093,183.67
Supplemental estimates	289,134,397.78
Total estimates	3,484,227,581.45
Appropriations made	3,479,552,505.09
Appropriations less than estimates	4,675,076.36

ESTIMATES, APPROPRIATIONS, RECEIPTS, AND EXPENDITURES (FISCAL YEAR 1928)—*Continued*

Ordinary receipts during fiscal year 1928:	
Estimated in 1928 Budget	3,772,753,077.00
Estimated June 30, 1927	3,920,544,160.00
Estimated in 1929 Budget	4,075,598,091.00
Actual (daily Treasury statement June 30, 1928)	4,042,348,156.19
Expenditures during fiscal year 1928, payable from ordinary receipts, including postal deficiency:	
Estimated in 1928 Budget	3,572,049,214.00
Estimated June 30, 1927	3,582,814,929.00
Estimated in 1929 Budget	3,621,314,285.00
Actual (daily Treasury statement June 30, 1928)	3,643,519,875.13
Surplus for fiscal year 1928:	
Estimated in 1928 Budget	200,703,863.00
Estimated June 30, 1927	337,729,231.00
Estimated in 1929 Budget	454,283,806.00
Actual (daily Treasury statement June 30, 1928)	398,828,281.06

RECEIPTS AND EXPENDITURES FOR THE FISCAL YEAR 1928

(As estimated June 30, 1927 and shown in the daily Treasury statement June 30, 1928)

	Estimated June 30, 1927	Actual June 30, 1928	Increase	Decrease
Receipts				
Customs	$ 587,000,000.00	$ 568,986,188.50	.....	$18,013,811.50
Internal revenue	2,735,000,000.00	2,794,971,222.37	$ 59,971,222.37	.....
Miscellaneous	598,544,160.00	678,390,745.32	79,846,585.32	.....
Total receipts	3,920,544,160.00	4,042,348,156.19	121,803,996.19	.....
Expenditures				
General	1,910,448,955.00	1,953,327,041.38	42,878,086.38	.....
Postal deficiency	23,000,000.00	32,080,202.46	9,080,202.46	.....
Panama Canal	9,000,000.00	10,448,879.83	1,448,879.83	.....
Total, ordinary business of Government	1,942,448,955.00	1,995,856,123.67	53,407,168.36	.....
Interest on public debt	720,000,000.00	731,764,476.30	11,764,476.30	.....
Refunds of customs and internal-revenue receipts	176,240,500.00	170,142,961.26	.....	6,097,538.74
Railroads	3,300,000.00	619,721.67 [1]	.....	3,919,721.67
War Finance Corporation	1,600,000.00 [1]	3,813,040.77 [1]	.....	2,213,040.77
Shipping Board and Merchant Fleet Corporation	19,840,000.00	34,881,713.16	15,041,713.16	.....
Alien property funds	150,000.00 [1]	351,151.52 [1]	.....	201,151.52
Adjusted service certificate funds	111,700,000.00	111,817,839.69	117,839.69	.....
Investment of trust funds	47,566,732.00	63,585,654.71	16,018,922.71	.....
Public debt retirements required to be made from ordinary receipts	563,468,742.00	540,255,020.30	.....	23,213,721.70
Total expenditures	3,582,814,929.00	3,643,519,875.13	60,704,946.13	.....
Estimated surplus June 30, 1927	337,729,231.00	.....	.....	.....
Actual surplus June 30, 1928	.....	398,828,281.00	61,099,050.06	.....

[1] Excess of credits—deduct.

SUMMARY OF DIFFERENCES BETWEEN ESTIMATES OF JUNE 30, 1927, AND ACTUAL RESULTS OF JUNE 30, 1928

Estimated surplus June 30, 1927, as above	$337,729,231.00
Actual surplus June 30, 1928, as above	398,828,281.00
Total difference (increase)	61,099,050.00
This improvement in the Government's financial condition as it was estimated June 30, 1927, is accounted for as follows:	
Increase in receipts, as above	121,803,996.19
Increase in expenditures, as above	60,704,946.13
Total difference (net increase)	61,099,050.06

COMPARATIVE ANALYSIS OF RECEIPTS AND EXPENDITURES FOR THE FISCAL YEARS 1927 AND 1928

(As shown in the daily Treasury statements)

	Fiscal Year 1927	Fiscal Year 1928	Increase	Decrease
Receipts				
Customs	$ 605,499,983.44	$ 568,986,188.50	.....	$ 36,513,794.94
Internal revenue:				
Income tax	2,224,992,800.25	2,173,952,556.73	.....	51,040,243.52
Miscellaneous internal revenue	644,421,541.56	621,018,665.64	.....	23,402,875.92
Miscellaneous receipts:				
Proceeds Government-owned securities:				
Foreign obligations:				
Principal	45,699,572.81	47,841,166.70	$ 2,141,593.89	.....
Interest	160,389,599.90	161,084,775.99	695,176.09	.....
Railroad securities	89,737,958.98	164,407,076.01	74,669,117.03	.....
All others	63,474,987.27	9,153,397.94	.....	54,321,589.33
Trust-fund receipts (reappropriated for investment)	48,476,630.97	63,395,443.58	14,918,812.61	.....
Proceeds sale of surplus property	18,068,529.98	8,770,250.64	.....	9,298,279.34
Panama Canal tolls, etc.	25,768,398.71	28,141,474.61	2,373,084.90	.....
Receipts from miscellaneous sources credited direct to appropriations	14,361,493.71	8,519,116.49	.....	5,842,377.22
Other miscellany	188,502,952.52	187,078,043.36	.....	1,424,909.16
Total	4,129,394,441.10	4,042,348,156.19	.....	87,046,284.91
Expenditures				
General expenditures	1,857,858,563.39	1,952,327,041.38	95,468,477.99	.....
Postal deficiency	27,263,191.12	32,080,202.46	4,817,011.34	.....
Panama Canal	8,305,345.04	10,448,879.83	2,143,534.79	.....
Total ordinary business of Government	1,893,427,099.55	1,995,856,123.67	102,429,024.12	.....
Interest on public debt	787,019,578.18	731,764,476.30	.....	55,255,101.88
Refunds of receipts:				
Customs	20,320,524.37	21,856,901.13	1,536,376.76	.....
Internal revenue	117,412,172.61	148,286,060.13	30,873,887.52	.....
Operations in special accounts:				
Railroads	1,042,746.21	1,619,721.67	.....	1,662,467.88
War Finance Corporation	27,065,781.61 [1]	3,813,040.77 [1]	23,252,740.84	.....
Shipping Board and Merchant Fleet Corporation	19,011,397.11	34,881,713.16	15,870,316.05	.....
Alien property funds	496,117.92 [1]	351,151.52 [1]	144,966.40	.....
Adjusted service certificate funds	115,219,352.30	111,817,839.69	.....	3,401,512.61
Investment of trust funds:				
Government life insurance fund	47,315,972.70	61,701,568.44	14,385,595.74	.....
Civil service retirement fund	425,194.65 [1]	109,272.28	534,466.93	.....
District of Columbia teachers' retirement fund	289,980.43	513,917.75	223,937.32	.....
Other funds	957,945.34	1,260,896.24	302,950.90	.....
Total ordinary	2,974,029,674.62	3,103,264,854.83	129,235,180.21	.....

[1] Excess of credits—deduct.

COMPARATIVE ANALYSIS AND EXPENDURES FOR THE FISCAL YEARS 1927 AND 1928—*Continued*

	Fiscal Year 1927	Fiscal Year 1928	Increase	Decrease
Public debt retirements required to be made from ordinary receipts:				
Sinking fund	333,528,400.00	354,741,300.00	21,212,900.00	.....
Purchases from foreign repayments	19,254,500.00	19,068,000.00	.....	186,500.00
Received from foreign governments under debt settlements	159,961,800.00	162,736,050.00	2,774,250.00	.....
Purchases from franchise tax receipts (Federal reserve banks)	1,231,834.78	618,367.05	.....	613,467.73
Forfeitures, gifts, etc.	5,578,310.00	3,091,303.25	.....	2,487,006.75
Total	519,554,844.78	540,255,020.30	20,700,175.52	.....
Total expenditures chargeable against ordinary receipts.	3,493,584,519.40	3,643,519,875.13	149,935,355.73	.....
Excess of ordinary receipts over total expenditures chargeable against ordinary receipts (surplus)	635,809,921.50	398,828,281.06	.....	236,981,640.64

ESTIMATES, APPROPRIATIONS, RECEIPTS, AND EXPENDITURES FISCAL YEAR 1929

(Exclusive of postal revenue and expenditures therefrom)

Estimates of appropriations:	
Preliminary by departments, Aug. 1, 1927	$3,677,053,585.01
Tentative allocations by the President	3,554,829,915.96
Submitted in 1929 Budget	3,505,793,765.53
Supplemental estimates	63,795,529.63
Total estimates	3,569,589,295.16
Appropriations made	3,563,033,922.06
Appropriations under estimates	6,555,373.10
Ordinary receipts:	
Estimated in 1929 Budget	3,809,497,314.00
Estimated in June, 1928	3,707,501,576.00
Expenditures payable from ordinary receipts, including postal deficiency:	
Estimated in 1929 Budget	3,556,957,031.00
Estimated in June, 1928	3,801,780,922.00
Difference:	
Estimated surplus in 1929 Budget	252,540,283.00
Estimated deficit in June, 1928	94,279,346.00

REVISED ESTIMATES OF EXPENDITURES, FISCAL YEAR 1929

(June 30, 1928)

Ordinary expenditures for operation of the routine business of the Government:	
Legislative establishment	$ 17,895,344.00
Executive Office	458,330.00
United States Veterans' Bureau	430,628,892.00
Federal Board for Vocational Education	8,121,052.00
Other independent offices	33,707,546.00
Department of Agriculture, exclusive of good roads	78,786,824.00
Department of Commerce	39,639,000.00
Interior Department proper	34,992,093.00
Indian Service	34,098,194.00
Department of Justice	27,455,053.00

REVISED ESTIMATES OF EXPENDURES, FISCAL YEAR 1929—*Continued*

Department of Labor	10,849,740.00
Navy Department	390,000,000.00
State Department	13,002,107.00
Treasury Department	199,619,000.00
War Department—	
Military and departmental	321,249,792.00
Nonmilitary	102,171,368.00
Panama Canal	9,260,000.00
District of Columbia	39,462,100.00
Deficiencies in postal revenues	60,049,139.00
Good roads	84,000,000.00
Pensions	221,592,000.00
Amended classification act	18,000,000.00
Total ordinary routine expenditures	2,175,037,574.00
Refunds of receipts, customs, and internal revenue	153,108,000.00
Capital outlays and operations in special accounts:	
Shipping Board and Merchant Fleet Corporation	45,000,000.00
War Finance Corporation	500,000.00
Railroads	770,000.00
Alien property settlement of claims	25,000,000.00
Reduction in principal of the public debt, required to be made from ordinary receipts:	
Sinking fund	368,699,700.00
Redemption of securities from Federal reserve and intermediate credit bank franchise tax receipts, etc	1,100,000.00
Payments of foreign governments received in United States securities	171,214,300.00
Total reduction in public debt from ordinary receipts	541,014,000.00
Adjusted service certificate fund	111,220,000.00
Investment of trust funds:	
Government life insurance fund	59,853,348.00
Civil service retirement fund	19,950,000.00
District of Columbia teachers' retirement fund	550,000.00
Other funds	778,000.00
Interest on the public debt	670,000,000.00
Total expenditures, including interest and principal of public debt and investments of trust funds	3,801,780,992.00

ANALYSIS OF STATISTICS

General Lord, Director of the Budget, makes the following comment on the preceding analysis:

"The foregoing statement shows that the total of ordinary receipts for the fiscal year ended June 30, 1928, was $4,042,348,156.19 as compared with $4,129,394,441.10 for 1927, a decrease of $87,046,284.91, composed of decreases of $36,513,794.94 in customs receipts and $74,443,119.44 in internal-revenue receipts and a net increase of $23,910,629.47 in miscellaneous receipts. The total of ordinary expenditures for 1928, including public-debt retirements required to be made from ordinary receipts and exclusive of expenditures for the Postal Service from the postal revenue, was $3,643,519,875.13, as compared with $3,493,584,519.40 for 1927, a net increase of $149,935,355.73, due to increases of $95,468,477.99 in general expenditures, $4,817,011.34 in the postal deficiency, $2,143,534.79 for the Panama Canal, $32,410,264.28 in customs and internal revenue refunds, $49,650,993.69 in operation in special accounts and trust funds investments, and $20,700,175.52 in public-debt retirements required to be made from ordinary receipts, which increases are partly offset by a decrease of $55,255,101.88 in interest on the public debt.

"Notwithstanding reduction in receipts due to reduction of taxes and increases in expenditures due to normal growth of Government activities and additional demands on the Treasury, the fiscal year 1928 was closed with a surplus of $398,828,281.06. Of this surplus $367,358,710.12 was used by the Treasury Department in a further reduction of the public debt beyond the reduction of $540,255,020.30, which was required to be

made from ordinary receipts, making a total reduction of the public debt of $907,613,730.42 during the fiscal year 1928. The surplus of receipts over expenditures for the fiscal years since the inauguration of the Budget system 1922 to 1928 aggregates $2,791,737,355.44. By utilizing these surpluses and by reducing the working balance in the Treasury the outstanding public debt has been reduced by $3,075,888,480.41 beyond the retirements required to be made from ordinary receipts."

FEDERAL AID TO STATES

For and Against.—One type of expenditure of the Federal Government which has been on the increase, and which has been viewed with alarm by many, has been the aid extended to the states for various projects. President Coolidge has often voiced his objection to this practice, although it has many strong advocates. A. F. MacDonald in a book, *Federal Aid* (Crowell), recently published, concludes very strongly for this practice. He contends that the case for Federal aid stands on five grounds: 1. It stimulates state interest and state activity; 2. It brings about a certain degree of uniformity without ignoring differences in local needs; 3. It raises local standards and establishes a national minimum of efficiency; 4. It equalizes to some extent the tax burdens of the several states; 5. It recognizes and reaffirms the principle of local autonomy.

Where the Aid Goes.—The most important objects of Federal aid to the states are forest fire prevention, agricultural extension work, highways, the National Guard, vocational education, vocational rehabilitation, and hygiene of maternity and infancy. Any one interested in an excellent discussion of these will do well to refer to the book by MacDonald, mentioned above.

ADMINISTRATION

Use of Business Methods.—The past year has shown no tendency to relax in the use of business methods to the end that administrative costs be reduced to a minimum. The employees and officers of the Federal Government throughout the country are organized into 267 business associations. In addition to their regular duties, the members of these associations are concerned with the formulation of plans whereby a more economical and efficient administration of the activities of the government may be accomplished.

Economy and Efficiency Aims.—A law passed May 28, 1928, is designed to secure greater economy and efficiency in the personnel of government employees. The aim is to have the business of the government better performed with fewer employees. Among other things the act provides for a survey by the Personnel Classification Board of positions in the field service, with some exceptions, and for a report to Congress of the salary schedules which the Board may consider proper. An appropriation of $75,000 was allowed to enable the Board to study the compensation of positions in private business for purposes of comparison with the compensation of positions of similar character in government service.

The Two Per Cent Club has continued its activities through the year. These affect most of the employment of personnel, the largest single overhead expense of the government. The aim of this club is to save not less than two per cent of the money available for personnel by permitting a sufficient number of vacancies to remain unfilled. During 1928 a saving of about $20,000,000 was thus effected.

Service Unity.—H. C. Smither is the chief coördinator, whose business it is to secure unity in the activities of the government and thereby avoid duplication and waste. According to his report, the work of the area coordinators has been very commendable. They have been active in the dissemination of information and operating instructions, in the initiation of transfers of property at large, in the loans of services, equipment and personnel, and in the relief of congestion in public and rented space. A saving of more than $1,641,000 is directly attributable to such activities.

Savings Effected.—Many of the business associations have reported definite savings to the government because of policies or practices followed. Thus the association in charge of real estate reports a saving of more than $652,000; the Department of Agriculture claims saving of more than $680,000; the Department of Interior, by consolidation and abolishment of positions, saved $456,800 in salaries alone; the Bureau of Immigration affected a saving of $560,000 in handling deportees alone; the Post Office Department was able to save $7,500,000 in carrier and service; the War Department and Navy Department, as well as the other departments and divisions, all reported many instances in which a substantial saving was affected. The indication is that the idea of economy has permeated all the departments of the government.

BUSINESS ORGANIZATION OF THE GOVERNMENT

Meetings.—The fourteenth regular meeting of the business organization of the government was held in Memorial Continental Hall on January 30, 1928, and the fifteenth meeting was held at the same place on June 11. The proceedings of both these meetings were broadcast. In his address at the first meeting, President Coolidge stated that the major effort in undertaking to establish the correct relationship between needs and resources was to promote the mental, moral, and spiritual welfare of the people. After reviewing the accomplishments under the seven years of the budget, he emphasized the fact that economy in Federal operations was here to stay, and that true economy means the discouragement of unnecessary expenditure and carries no thought of unwise, unscientific limitation. Many new demands have been met, he said, with no expansion in the expenditures, because of the insistence upon wiser spending.

Gen. Lord on Accomplishment.—In his address the Director of the Budget pointed out the many economies which were being put into effect and closed by saying that "the business of the United States Government was never conducted so efficiently as now; its methods never so adequate; its activities never in such healthy condition; its physical plant never so amply financed; its business organization never so equal to its great task, the morale and esprit of its faithful army of employees never so marked; never such devotion to the public welfare, and never such interest in the public service."

President Coolidge's Address.—In his address at the fifteenth meeting, the President emphasized the obligation of the people to the government and discussed the effect on business and on individuals of the four reductions in taxes since 1921. He expressed alarm at the increasing cost of government in the United States, the increase having been from $9,500,000,000 in 1921 to $11,607,000,000 in 1926. He also expressed some concern for 1929 and 1930. For 1929 the estimated recepits are $3,707,000,000 and the estimated expenditures $3,801,000,000. This would indicate a deficit, which, he said, we must not have, and urged upon every one in the service to use the greatest care in arranging expenditure programs. Touching upon the personnel, he said he was just as much in favor of adequate compensation as he was opposed to excessive compensation. Since many salaries had recently been increased, it was now the duty of the supervising officers to see that they were earned, and if the present incumbents were not capable of earning them, they should be replaced by those more competent.

FEDERAL RESERVE REVISION

Ways and Means Committee Hearings.—From October 31 to November 10, 1927, the Committee on Ways and Means held formal hearings relative to the revision of the Federal reserve system. The hearings were divided to cover different phases of the reserve system, the most important dealing with general considerations, the income tax in corporations, the income tax on individuals, general administrative features, excise and stamp taxes, the estate tax, and miscellane-

ous ones. Statements were made before the committee by government officials and by many private organizations and individuals, either in person or through briefs which were presented.

Objections Presented.—At some time in the hearings objection was made to practically every part of the revenue system and it would be impossible here to list them. Many of them, of course, were because some part of the system affected particular individuals and they wished modification from a purely selfish motive. Two features which received a great deal of discussion were the tax of 13½ per cent of the net income of corporations and the Federal estate tax.

Corporation Tax.—The principal objections to the corporation tax were that it discriminated against corporations in favor of businesses conducted by individuals and partnerships and that the burden was particularly felt by the small stockholder. The tax could but mean a substraction from dividends and the man with a small income might perhaps be subject to no personal income tax or certainly one less than 13½ per cent.

Estate Tax.—The principal objection to the estate tax was that it was not primarily a revenue measure, but one designed to modify the inheritance tax as used by the states. The fact that the Federal Government allowed a credit up to 80 per cent of the amount of estate tax levied for inheritance taxes collected by individual states was the evidence for this contention. Since the state of Florida levies no inheritance tax, the representatives from Florida were especially critical of the estate tax.

REVENUE ACT

Summary of Changes.—The Revenue Act of 1928 was approved May 29, 1928. Professor Roy G. Blakey, in the *American Economic Review* for September, 1928, summarizes the principal changes made by the new law as well as the proposals which failed of enactment as follows:

1. The rate of the tax upon corporate incomes is reduced from 13½ per cent to 12 per cent. The lower rate is applicable to incomes of 1928 and succeeding years. This reduction will cause an annual loss in revenue estimated at $123,450,000.

2. The "specific credit" allowed domestic corporations having a net income of $25,000 or less is increased from $2000 to $3000. Estimated revenue loss, $12,000.000.

3. The 3 per cent tax upon the manufacturers' prices of passenger automobiles is repealed. Loss, $66,-000,000.

4. The exemption from the tax upon amounts paid for admissions to theaters and other places of amusement except admissions of $5 or more to prize fights is increased from 75 cents to $3. Loss, $17,000,000.

5. The exemption from the 10 per cent tax upon club dues is increased from $10 to $25. Loss, $1,000,000.

6. The maximum upon which the earned income credit is permitted is increased from $20,000 to $30,000. Loss, $4,500,000.

7. The taxes on still wines are reduced to the pre-war level; that is, from 16 cents, 40 cents, or $1.00 to 4 cents, 10 cents, or 25 cents per gallon, according to alcoholic content. The tax on grape brandy is reduced from 60 cents to 10 cents per proof gallon. Loss, $1,000,000.

8. The one cent per gallon tax on cereal beverages is repealed. Loss, $185,000.

9. The tax on retailers of narcotics is reduced from $6 to $3. Loss, $150,-000.

10. The tax on the use of foreign built yachts, $2, $4, or $8, per foot of length, is repealed. Loss, $10,000.

11. The term "motor boat" is defined so as to subject foreign built yachts to the 30 per cent customs duty of the Tariff Act of 1922. Estimated increase in revenue, $50,000.

12. More tax on "tax-free covenant" bonds is to be withheld at the source in the case of non-resident aliens and foreign corporations. Increase, $2,000,000.

13. The tax upon $5 or more expensive admissions to prize fights is increased from 10 per cent to 25 per cent. Increase, $750,000.

Estimated reductions in revenue	$225,295,000
Estimated increases in revenue.	2,800,000
Net reductions	$222,495,000

Additional Changes.—The new law includes other changes of more or less importance having reference to the following: installment sales accounting, the basis for determining gain or loss on sales of property by estates or beneficiaries, inclusion of gains from the sale or other disposition of property of insurance companies (other than life or mutual), exemption of income derived by a foreign central bank of issue from bankers' acceptances, employees' and pension trusts, the allocation of depreciation between life tenant and remainderman, interest on refunds, closing agreements, statute of limitations, changing regulations without retroactive application, reference of refunds or credits in excess of $75,000 to the Joint Committee on Internal Revenue Taxation before payment to the taxpayer, and other technical and administrative matters.

PROPOSALS NOT ENACTED

1. Repeal or substantial modification of the Federal estate tax.
2. Publicity of income tax returns.
3. Reduction of taxes to the extent of $400,000,000, largely through the reduction of the rate on corporations to 10 per cent. (This much reduction was not approved by either House.)
4. Application of the reduced tax rate on corporations beginning with incomes of 1927 instead of 1928.
5. Lower and graduated rates upon corporations having net taxable incomes of $15,000 or less.
6. Taxation of dividends paid out of corporate earnings accrued but undistributed prior to March 1, 1913.
7. Prohibition of consolidated returns by affiliated corporations.
8. Substantial modification of Section 220 of the Revenue Act of 1926, in order to prevent evasion of surtaxes through unreasonable accumulation of corporate surpluses.
9. Reduction of surtax rates on individual incomes of $20,000 to $80,000.
10. Change in normal or surtax rates or in personal exemptions applicable to net incomes of individuals.
11. Reduction of sale or transfer tax on stock exchange sales.
12. Repeal of the stamp tax on future sales of produce on exchanges.
13. Allowance as a deduction from gross income of all expenses incurred in contesting any tax, whether Federal, state, municipal, or otherwise.
14. Allowance as deductions, to owner or long-term lessee of a "cooperative" apartment, of amounts representing the apartment owner's share of the interest and taxes payable by the corporation operating the apartment rather than the allowance of such deductions to the corporation.
15. Allowance as deductions to professional men for traveling and other expenses, attending meetings for professional associations, similar deductions in connection with trade or business being permitted already.
16. Reduction of statutory requirements for retirement of the public debt.
17. Reorganization and consolidation of the field and office forces now under the Revenue Agents and the Collectors of Internal Revenue.
18. Simplified method of calculating the earned income credit.
19. Various tariff amendments, especially for "farm relief."

THE NATIONAL BUDGET

By Arthur E. Buck

National Institute of Public Administration

FORMULATION OF THE 1929 BUDGET

Presidential Limitation on Total.—The actual work of formulating the budget for 1929, that is, for the fiscal year beginning July 1, 1928, began in the summer of 1927. At the semi-annual meeting of the "Business Organization of the Government," held in Memorial Continental Hall on June 10, 1927, President Coolidge,

upon the basis of preliminary figures prepared by the Bureau of the Budget, set the expenditure limit of the 1929 budget. He said:

"Another task now facing you is the preparation of your estimates for the fiscal year 1929. We are striving as always to pave the way for further reduction of debt and of taxes. This in itself necessitates unremitting effort to hold the level of our expenditure program. After a careful study of our probable financial condition in 1929, it is my desire that the estimates of appropriations for that year be held within a total of $3,300,000,000. This is exclusive of reduction of the debt, the Postal Service, and tax refunds. This maximum has not been fixed arbitrarily. It is the result of careful study of the probable financial conditions in 1929. Fixed charges have been balanced against the best possible estimate of receipts. In establishing this maximum for estimates for 1929, I expect the Budget Director to limit the calls of the various departments within that amount. His task will be simplified by the full coöperation which he will have from you."

Preliminary Estimates.—Following this statement of expenditure policy by the President, preliminary estimates for the 1929 budget were filed with the Bureau of the Budget by the several departments and establishments of the government. An examination of these estimates showed that they exceeded by $157,668,000 the expenditure limit set by the President. The Bureau of the Budget was then instructed by the President to notify each department or establishment of the maximum total which had been tentatively allocated for its 1929 estimates. These allocations exceeded the President's expenditure limit by over $254,000,000, amounting in the aggregate to more than $3,554,000,000. This was explained by the fact that tax refunds, civil service retirements, and certain indefinite appropriations were included which were not anticipated in the President's original limitation. The regular estimates were then prepared by the departments and establishments, keeping in mind their tentative allocations. These estimates were reviewed and revised by the Bureau of the Budget, and the budget for 1929 was prepared and transmitted to Congress by the President on December 7, 1927. This budget carried proposed expenditures for 1929 totaling $3,505,793,765.53, exclusive of $753,000,000 for the Postal Service, or a grand total of $4,258,793,765.53.

Supplementary Estimates.—After the 1929 budget was transmitted to Congress, the President (as he has a right to do under the Budget and Accounting Act of 1921) submitted supplementary estimates during the session which aggregated $22,071,319.38, making a grand total of $4,280,865,084.91. As compared with this amount, the supplementary estimates submitted by the President in connection with the 1928 budget had totaled $8,400,633. In addition to the supplementary estimates to the 1929 budget, the President also submitted to Congress deficiency estimates for the fiscal year 1928 and prior fiscal years amounting in the aggregate to $356,511,729.23. Of this amount, $203,675,193.27 was shown in the budget document for 1929 as transmitted at the beginning of the session. The remainder, or $152,836,535.96, was additional deficiency estimates submitted after the 1929 budget had been sent to Congress. That is, there were estimates before Congress totaling almost $175,000,000 which had the approval of the President and which were not included in his original budget. The major part of this amount, however, is due to the Federal system under which it is possible for the spending departments and agencies to incur deficiencies which are met by deficiency appropriations made during the fiscal year or even after it has closed. Even so, these belated estimates indicate a failure on the part of the administration to make adequate expenditure recommendations at the time the budget is prepared. Anticipating possible criticism on this score, President Coolidge said in his 1929 budget message: "In our great and growing government changes are kaleidoscopic

and new needs and imperative new demands arise over night calling for congressional help. . . . While actual deficits are rare, supplementals, because of the reasons cited, persist, and persist large in amount and many in number."

Surplus Estimates.—The revenues applicable to the President's budget for 1929 were estimated at $3,809,497,314, exclusive of the postal receipts. After deducting the total estimated expenditures, including the requirements for public debt retirement, an estimated surplus of $252,540,283 remained. It is the practice not to include the surplus of the previous year as a means of financing the budget. This surplus for 1928 was estimated at $454,283,806. The surplus for 1927 had actually been a great deal larger; that is, $635,809,921.70, according to the Treasury statement of June 30, 1927. Of this latter surplus, $612,000,000 was applied to the redemption of the national debt. The size of the actual surplus of 1927 and also of the estimated surplus of 1928 led President Coolidge to recommend to Congress in his budget for 1929 a tax reduction of $225,000,000. However, by way of caution, he pointed out that of the 1928 surplus estimated at over $454,000,000 (the exact amount we have noted above), $318,000,000 was from nonrecurring sources, and only $136,000,000 from current and continuing sources. As a matter of fact, the actual amount of the surplus, as later shown by the Treasury statement of June 30, 1928, was $398,828,281.06. Incidentally, this is perhaps the first time that the budget estimates of revenues (receipts, as they are called) have not been more than realized.

BUDGET LEGISLATION

Appropriation Bills.—When the President's budget for 1929 was submitted to Congress, it was, according to the usual practice, referred to the Committee on Appropriations of the House for immediate action. Two or three weeks prior to this time this Committee had been holding hearings on the departmental estimates, which had already been scrutinized by the Bureau of the Budget and brought within the limits tentatively set by the President. Some of the ten major appropriation bills, which in practice are framed by subcommittees of the large committee, were almost ready for the consideration of the House at the time the budget was submitted. The House acted rather expeditiously on the appropriation bills, but the Senate followed about the same dilatory tactics as in the previous session. There was a marked tendency on the part both of the House and of the Senate to vote appropriations without much regard for the ultimate total or the effect that it might have on the proposed tax reduction. More than once, the chairman of the House Committee on Appropriations, the late Representative Martin B. Madden, found it necessary to warn Congress to curb its appropriations in order to preserve the proper balance between the national outgo and income.

Revision of Items by Congress.—The grand total of the President's expenditure recommendations, including the supplementary and deficiency estimates submitted during the session, was $4,637,376,814.14. In taking action on these recommendations, Congress reduced the total by $9,331,779.05. This reduction did not result from a general scaling down of the budget proposals; instead, numerous increases and decreases were made in the various appropriation bills. The agricultural appropriations were $1,008,954 in excess of the budget proposals, due mainly to addition of a million dollars for forest roads and trails. The appropriations for the War Department were increased by $6,655,208 over the President's proposals. Most of this increase was for the improvement of the Missouri River. The naval appropriations were $880,905 in excess of the budget recommendations, mainly as a result of an increase in the enlisted strength from 83,250 to 84,000. Reductions which practically offset these increases were made in the Treasury, Post Office, and Interior Departments. An amount almost equal to the total

reduction made by Congress in the President's budget recommendations was cut out of the second deficiency bill for 1928. If it had not been for the paring down of this bill, Congress would have shown only a very slight reduction in the budget proposals. In fact, the regular annual appropriation acts showed only a reduction of $574,755 under the President's recommendations.

Future Appropriations.—In addition to the appropriations made by Congress for 1929, a number of acts were passed requiring appropriations to be made for as long as ten years in the future. The sum total requirements of these acts, if provided for, will exceed $1,000,000,000. The more important of these acts are the Mississippi Flood Control Act, providing for an expenditure over ten years of approximately $330,000,000, the Merchant Marine Act providing a fund of $200,000,000, the act allowing Federal aid for road construction to the extent of $165,000,000, the Alien Property Act and the Public Buildings Act, each setting aside $100,000,000. While the initial appropriations were made to carry out many of these acts, a large amount remains to be appropriated in succeeding years. For example, $15,000,000 was appropriated to start the Mississippi flood control work.

ANALYSIS OF THE APPROPRIATIONS FOR 1927-28

The total appropriations made by the Congressional session which ended on May 29, 1928, may be summarized in the following manner:

Total in regular annual acts	$2,906,585,736.28
Total in deficiency acts	346,954,705.28
Total in miscellaneous acts	800,000.00
Total of permanent and indefinite appropriations	1,373,704,593.53
Total for session	$4,628,045,035.09

When classified according to the fiscal years to which the appropriations apply, the above grand total gives the following results:

Fiscal year 1929	$4,322,148,922.06
Fiscal year 1928	283,409,395.22
Fiscal year 1927 and prior years	22,486,717.81
Total	$4,628,045,035.09

To aid in visualizing the purposes for which the appropriations are made, the total may be broken up into large groups, representing the principal objects of expenditure. The groups with amounts and percentages are shown in the following tabulation:

Object of Expenditure	Amount of Appropriation	Percentage of Total
Interest on the public debt	$ 670,000,000.00	14.5
Sinking fund and other public debt retirement funds	541,623,393.53	11.7
Veterans Bureau, including insurance, compensation, hospitalization, adjusted compensation, and hospital construction	586,461,094.71	12.7
Postal Service	776,974,541.45	16.8
Navy	392,617,307.22	8.5
Military activities, War Department (Army)	334,703,357.75	7.2
Pensions, all wars prior to World War	256,000,000.00	5.5
Pensions of civil employees (toward Government's accrued liabilities)	19,950,000.00	.4
Federal aid for construction of roads, roads in forest reserves, and for gratuity to States of Vermont, New Hampshire, and Kentucky for damage or destruction of roads by floods	85,577,294.00	1.9
Refund of internal revenue taxes	173,000,000.00	3.7
Shipping Board and Merchant Fleet Corporation	13,688,750.00	.3
Rivers and harbors, flood control acquisition of Cape Cod Canal property, operation of Panama and other canals	118,829,510.00	2.6
Enforcement of prohibition, including sums for the Bureau of Prohibition, Coast Guard, customs service, and estimated amounts under the Department of Justice	36,000,000.00	.8
Settlement of war claims (alien property, etc.)	50,000,000.00	1.1
Construction of public buildings within and without the District of Columbia and for acquisition of property for sites for public buildings	54,315,083.56	1.2
All other activities, including the Executive Office, Congress, the judiciary, the executive departments, the independent establishments, payment of judgments, etc.	518,304,702.87	11.1
Total	$4,628,045,035.09	100.0

COURSE OF LEGISLATION

Deficiency Bill.—The total appropriations of the session, namely, $4,628,045,035.09, exceeded the appropriations of the preceding session by $478,542,508.44. Part of this increase may be attributed to the failure of the second deficiency bill to pass Congress on account of the Senate filibuster at the close of the session in March, 1927. This bill, amounting to $120,000,000, was carried over to be passed by the next session. Even after making allowance for the amount of this bill, the increase is $238,542,508.44. In the face of this increase of nearly a quarter of a billion dollars, Senator Warren, chairman of the Senate Committee on Appropriations, thought some comment necessary in his annual financial review. "Prosperity and good times," he said, "demand increased as well as new governmental functions." Representative William R. Wood of the House Committee on Appropriations went even further when he observed: "If the nation lives within its income, reduces its debt, and still has a margin left with which to reduce the tax burden, it can hardly be accused or convicted of extravagance merely because there is an increase in totals."

President's Vetoes.—The President vetoed about a dozen bills during the session, three of which were passed over his veto. These latter bills provided for a total expenditure of about $11,500,000. Two of the bills increased the pay of certain postal employees and the maintenance allowance of fourth class postmasters. The third bill related to the retirement of disabled emergency officers. The Senate passed a fourth bill, over the President's veto, providing $3,500,000 aid for road construction, but the House failed to pass it. This action on the part of Congress came about five days before the end of the session, being largely due to resentment in the Senate on account of the veto message of President Coolidge on the McNary-Haugen Farm Relief Bill. Congress adjourned on May 29, 1928, after an all night filibuster in the Senate over the Boulder Dam Bill, which would have involved an estimated expenditure, had it passed, of $25,000,000.

Criticism.—During the session, the Bureau of the Budget came in for criticism by some members of Congress belonging to the majority party. It arose over the practice of having the Bureau pass on certain measures which are before the legislative committees to determine if they are in harmony with the President's financial policy. In discussing this point on March 10, Representative Robert Luce of Massachusetts, said: "The importance of the situation lies in the fact that this virtually gives the Director of the Budget the whip hand over a large part of the work of the House." He then went on to give a number of examples of bills which had been recently acted upon and concluded by stating what he conceived to be the distinction between general legislation and appropriations. "The legislating committee," he said, "is to concern itself with policy and principle; the appropriating committee with prudence and proportion. It is the appropriating committee that should consult the Bureau of the Budget."

TAX REDUCTION

The House Committee on Ways and Means began holding hearings on the proposed Tax Reduction Bill more than a month before Congress convened. As a result, the bill (H. R. 1) was passed by the House on December 15, or within a fortnight after the session opened. When the bill was sent to the Senate, it provided for a tax reduction of approximately $290,000,000. Secretary Mellon asked the Senate to defer action on the bill until the income tax returns were filed in March. He then advised Congress that a tax reduction of $182,000,000 was all that seemed advisable in view of the treasury condition. The Democratic members took issue with this statement, and talked of a cut of $300,000,000, or more. On May 25, the Tax Reduction Bill, providing for a cut of $205,000,000, passed the Senate. It then went to a conference committee which fixed

the reduction at approximately $222,495,000. In this form, it was accepted by both houses and approved by the President on May 29, the final day of the session. The reduction was brought about largely by lowering the corporation income tax from 13½ to 12 per cent, by an increase in the exemption granted to small corporations, by the increase to $3 of the exemption in theatrical admissions, and by the repeal of the automobile sales tax. Prior to the passage of this act, there had been three downward revisions in the Federal taxes since the Great War. These revisions occurred in 1921, 1924 and 1926. The total reductions, including those estimated under the 1928 act, are put at $1,826,000,000.

EXECUTION OF THE BUDGET

Semi-Annual Meetings.—One of the means of enlisting the support of the bureau chiefs and other subordinate officers of the administration in carrying out the expenditure plan of the budget is the semi-annual meetings of the "Business Organization of the Government." These meetings have been held ever since the national budget system was inaugurated in 1921, the fifteenth one being held on June 11, 1928. The President and the Director of the Budget address these gatherings and their speeches are broadcast throughout the country.

Budgetary Control.—While President Coolidge has said that the general purpose of these meetings was to "report to the people on our stewardship and to plan our policies for future operations," the real reason for them seems to be this: to meet indirectly the need for genuine budgetary control. The President and the Bureau of the Budget are without any legal authority to control the expenditure of appropriations by the bureau heads; therefore, these heads are brought together semi-annually and admonished to keep within the appropriations granted by Congress, to adopt the method of setting up a small reserve, which may be used to meet emergencies during the year or may remain unexpended at the end of the year, and to make all possible savings, however small, in their operating costs. That this is the case is indicated by the remarks of President Coolidge in his speech to the semi-annual meeting held on June 10, 1927. He said:

"In connection with your plans for 1928, I reiterate the principle established during these budget years, that the amount made available by the Congress constitutes the maximum of expenditure and not the minimum. You must divest your minds of thought of possible accessions to the amounts given and administer your activities with the purpose of effecting every proper saving. You must consider the grant of budgetary funds by Congress as final for the year and for the purposes appropriated."

At this meeting of June 10, 1927, the bureau chiefs were not only given instructions with reference to the preparation of their estimates for the 1929 budget, but they were told in general terms what would be expected of them in carrying out the 1928 budget, which became operative on July 1, 1927. The next semi-annual meeting was held on January 30, 1928. The President spoke with satisfaction at this time of the way the 1928 budget was being carried out. But at the meeting held on June 11, 1928, he was not so optimistic. "We are facing a situation," he said, "where the full utilization of the funds authorized by Congress may exceed our estimated receipts. The duty is upon us to see that our outgo does not exceed our income." Still the fiscal year ended on June 30, with a considerable surplus, as pointed out above. However, the estimated condition of the treasury at the end of the succeeding fiscal year indicated a deficit of over $94,000,000. This information was somewhat disturbing to President Coolidge, so he asked the Director of the Budget to see what means could be found to avert it in expending the appropriations under the 1929 budget.

Per Cent Clubs.—An idea which General Lord, the Director of the Budget, hit upon for bringing about certain savings in the operating ex-

penditures of the different departments and agencies is the organization of clubs. At his direction, the first of these clubs—the Two Per Cent Club—was organized in January, 1925. It is reported to have saved $60,000,000. In June, 1925, the One Per Cent Club was organized. It is said to have saved an equal amount. In January, 1926, the Two Per Cent Personnel Club was started. It is estimated to have saved several million dollars. Then in January, 1927, the Correspondence Club was inaugurated upon the discovery that the government correspondence cost an average of 26 cents a letter. The purpose of this club seems to be to spur up the output of stenographers. Last but not least, came the Woodpecker Club, which was instituted in June, 1927. Its purpose is to encourage each of the half a million or more employees in the government service to save as much as a dollar during the year. No reports are required: this club is called the "settle-with-your-own-conscience organization." While these clubs may aid in bringing about certain savings, they cannot be regarded as a substitute for budgetary control in any sense of the term.

Coördinating Agencies.—Another attempt to set up limited budgetary supervision is that provided through the coördinating agencies which work in the various departments, principally the War and Navy departments, under the direction of the Bureau of the Budget. These agencies have been in existence for seven years. Their main task is to bring about coöperation between the departments and establishments in carrying on their functions, more particularly in the use and disposition of surplus supplies and materials.

Apportionment.—Finally, there is the method of allotting or apportioning the appropriations, which was originally provided for under the Antideficiency Act of 1906. This act, however, was never properly enforced until after the Bureau of the Budget was established. Under the provisions of this act, supplemented by regulations issued by the Director of the Budget, the spending agencies are required to apportion their appropriations according to the quarters of the fiscal year, to file copies of this allotment with the Budget Bureau, and to keep it posted on how their expenditures are running with respect to the allotment. This practice may be said to embody the rudimentary beginnings of real budgetary control.

NATIONAL DEBT AND ALLIED DEBTS TO UNITED STATES

By Francis H. Sisson

Vice President, Guaranty Trust Company of New York

PUBLIC DEBT OF THE UNITED STATES

Reduction.—At the end of the last fiscal year, on June 30, 1928, the gross public debt of the United States amounted to $17,604,290,562.93. Retirements in the last few months have reduced the total to a somewhat smaller sum, the preliminary estimate for the end of October being $17,544,000,000. This total represents a reduction of about $9,000,000,000, or a little over one-third, from the peak figure of 1919. The average annual reduction during the last nine years, therefore, has been almost exactly a billion dollars.

During the first four months of the current fiscal year, debt receipts, which include the issue of new securities for refunding purposes, totaled $1,498,000,000 and debt expenditures, which include public debt retirements chargeable against ordinary receipts, amounted to $1,558,000,000, showing a net reduction in the public debt during this period of $60,000,000. The expenditures included $370,000,000 for purchases for the sinking fund in connection with the redemption of Third Liberty Loan bonds.

Analysis.—Of the $17,604,000,000 outstanding on June 30 last, $17,318,000,000 was interest-bearing debt.

This total comprised $9,462,000,000 of Liberty bonds, $2,900,000,000 of Treasury notes, $2,791,000,000 of Treasury bonds, $1,252,000,000 of certificates of indebtedness, $768,000,000 of pre-war bnods, and $144,000,000 of Treasury savings certificates. Only two main groups of Liberty bonds are now outstanding: First Liberty Loan bonds amounting to $1,939,000,000 and Fourth Liberty Loan bonds amounting to $6,294,000,000.

Treasury Surplus.—During the last fiscal year, the Treasury surplus amounted to $398,000,000. Of this amount, $367,000,000 was applied to public debt retirement during the year; and this, together with payments from the sinking fund and other debt retirements chargeable against ordinary recepits, amounting to $540,000,000, make a total reduction of $907,000,000 from the $18,511,000,000 outstanding at the beginning of the year.

LIBERTY LOANS

Refunding Operations.—In addition to the debt reductions, refunding operations were effected in connection with outstanding bonds of the Second and Third Liberty Loans. Altogether, during the eighteen months from March 15, 1927, to September 15, 1928, the Treasury retired or refunded into securities bearing lower rates more than $5,000,000,000 of Second and Third Liberty Loan bonds. As a result, the Second and Third Liberty Loans have entirely disappeared from the interest-bearing debt. Only $1,229,000,000 of Third Liberty Loan bonds were outstanding at the end of the fiscal year, as against $2,147,000,000 on January 1, 1928. This reduction was due in part to refunding operations in anticipation of the maturity of the debt on September 15.

Third Liberty Loan.—The operations leading up to the final retirement of the Third Liberty Loan may be summarized as follows: The amount of bonds originally issued on May 9, 1918, was approximately $4,176,000,000. By the end of 1927, $2,028,000,000, or very nearly half, had been retired, chiefly through the sinking fund, surplus money in the Treasury, proceeds of cash debt payments by foreign governments, and bonds of this issue received from foreign governments in payment of debts. Of the $2,148,000,000 outstanding at the beginning of this year, $607,000,000 was exchanged during January for 3½ per cent Treasury notes, $108,000,000 was exchanged during July for 3⅜ per cent Treasury bonds, and $477,000,000 was purchased by the Treasury from the sinking fund and the Treasury surplus. Only $955,000,000, therefore, remained for redemption at the maturity of the loan. Of this amount, $103,000,000 was exchanged on and after September 15 for 4½ per cent Treasury certificates of indebtedness, $203,000,000 was redeemed from September 15 to 27 from the sinking fund, and $453,000,000 was redeemed during the same period from tax receipts; so that $196,000,000 remained on September 27, not as a part of the interest-bearing debt, but as a part of the matured debt on which interest had ceased. By the end of October this total was reduced to less than $92,000,000.

Interest Saving.—The retirement and refunding operations during the last fiscal year resulted in an annual saving of $55,000,000 to the Treasury. Interest payments during the twelve months ended June 30, 1928, amounted to $732,000,000, as against $787,000,000 in the fiscal year 1927. The saving due to refunding operations alone is indicated by the fact that the annual interest rate on the interest-bearing debt on June 30, 1928, was 3.87 per cent, which compares with 3.96 per cent a year earlier and 4.29 per cent in 1921.

STATUS OF PUBLIC DEBT

Changes.—A general survey of changes in the public debt during the fiscal year 1928 shows that the reduction in the interest-bearing debt took place exclusively in the groups of obligations—Liberty bonds and Treasury savings certificates. The outstanding totals of the First and Fourth Liberty Loans were virtually unchanged; the Second Liberty Loan, which amounted to $1,306,000,000 at the beginning of the fiscal year, dis-

appeared entirely; and the Third was reduced from $2,148,000,000 to $1,229,000,000. The aggregate amount of Liberty bonds outstanding accordingly declined by $2,238,000,000, from $11,690,000,000 to $9,462,000,000. This decline was offset mainly by increases of $881,000,000 in Treasury notes and $550,000,000 in certificates of indebtedness, representing the refunding operations through which a part of the Liberty bonds had been retired.

Classification.—The public debt, classified by main groups, at the end of the fiscal years 1928 and 1927 was as follows (in millions of dollars):

	1928	1927
Pre-war bonds	728	767
Liberty bonds	9,462	11,690
Treasury bonds	2,791	2,764
Treasury notes	2,900	2,019
Certificates of indebtedness	1,252	702
Treasury savings certificates	144	309
Total interest-bearing debt	17,318 *	18,250 *
Matured debt	45	15
Debt bearing no interest	241	245
Total gross debt	17,604	18,510

* Slight discrepancies in totals due to omission of fractions.

War Debt.—The public debt of the United States is almost entirely a war debt. The highest total ever reported at the end of a fiscal year prior to the World War was $2,756,000,000 on June 30, 1866. The amount outstanding was reduced steadily to $2,151,000,000 in 1873; and thereafter, with minor interruptions, to $961,000,000 in 1893. For thirteen years before the outbreak of the war, the amount of the debt ranged between $1,100,000,000 and $1,200,000,000 and not until 1916 was the latter figure exceeded. In that year the total increased to $1,225,000,000. The fiscal year 1917, which witnessed the entry of the United States into the war, closed with a total gross debt of only $2,976,000,000. In 1918, however, the amount began to increase rapidly, the total at the end of that fiscal year being $12,244,000,000; and by the end of June, 1919, it had reached $25,482,000,000, the highest figure ever reported at the end of a fiscal period. Since that date the debt has been steadily reduced year by year, at the rate of about one billion dollars annually, as has already been noted. The annual reductions have ranged between $1,184,000,000 in 1920 and $322,000,000 in 1921.

DEBT RETIREMENT

Sources.—The chief source of the funds used for debt retirement and repayment has been the series of Treasury surpluses, which have provided altogether more than three billions of dollars for this purpose since the beginning of the fiscal year 1918. The second most important source of such funds is the sinking fund created by Congress; the third is the progressive reduction of the net balance in the general fund; and most of the remainder is accounted for by payments received from foreign governments on account of interest on principal on their debts to the United States.

Future Trend.—The enumeration of these leading sources of funds for debt retirement suggests an inquiry as to the probable trend in the future. While the amounts of Treasury surpluses or deficits over a period of years cannot be predicted, it is safe to say that future surplus revenues are very unlikely to provide funds for debt retirement comparable in amount with those of recent years. The situation, in this respect, since the close of the war has been quite exceptional. The conclusion of peace resulted in an abrupt drop in expenditures, while revenues were still adjusted to a war-time scale. The successive reductions in taxation have been made cautiously; the expected decreases in revenues have been diminished, and in some cases canceled altogether, by the increases in national income due to the growth and prosperity of the country. At present it appears that the reduction of revenues to a peace-time basis has been accomplished, and that the next few years will witness a much closer balance between Treasury receipts

and expenditures than has existed in the recent past. It must be remembered that the maintenance of a large surplus is not a Treasury policy, and that the large amounts of funds derived from this source were essentially accidental.

The same consideration applies with even greater force to the retirement of the debt through reductions in the general fund of the Treasury. This source of funds has been virtually exhausted, since the balance now maintained in the Treasury is only what is deemed necessary to provide ready cash for current transactions. There remain, therefore, as dependable sources of funds for future retirements only the sinking fund and the payments from foreign governments. The former is an assured source of funds, though its exact amount depends on the prices paid for bonds purchased in the open market, the average interest rate on bonds retired, and the interest payment dates on such bonds.

Payments by foreign governments are also a permanent and increasingly important source of funds, though here again the exact amounts available for debt retirement are uncertain. The law sets aside for public debt reduction only payments on account of principal of loans made under the Liberty Loan Acts. These loans represent about four-fifths of the funded indebtedness of foreign governments. Both principal and interest payments on all foreign loans have been used for debt retirement in recent years. Whether this practice continues to be followed will presumably depend on the general state of the Treasury balance.

Sinking Fund.—On the assumption that the future amounts yielded by the sinking fund are based on a uniform interest rate of 4¼ per cent on bonds retired, and that both principal and interest payments from foreign governments continue to be made when due and applied wholly to debt retirement, the combined total of these two items will, in about twenty years, exceed the principal of the public debt now outstanding. However, it must be recognized that this assumption is more likely to prove too pessimistic. It is possible that the sinking fund may be increased by exceptionally favorable conditions. On the other hand, the reverse may happen and, in addition, the payments from foreign gvoernments may fail or may not be available in their entirety for debt retirement.

On the whole, it may be anticipated with a fair degree of confidence that, in the absence of wholly unforeseen developments of fundamental importance, the reduction of the public debt will continue at a reasonable rate. But a conservative view of the situation suggests that future retirements will hardly keep pace with those that have been made possible by the exceptionally favorable conditions of the last few years.

DEBTS OF FOREIGN GOVERNMENTS TO THE UNITED STATES

Present Value.—Obligations of foreign governments held by the United States Treasury on June 30, 1928, amounted to $10,905,000,000. The total amount receivable was somewhat greater, because of accrued interest for which no obligations were held and because certain governments that had concluded funding agreements with the United States had not yet delivered the new obligations provided for in the agreements in exchange for the old obligations held by the Treasury. However, the nominal amounts of these obligations mean little in any case, since the greater part of the total amount shown represents obligations in which future, as well as past, interest has been funded into principal. If the face value of the funded debt obligations payable in the future is discounted at a current rate of interest—say, 4 or 4½ per cent—the present value of the indebtedness of foreign governments is about five billion dollars less than the nominal amount due.

Funding Agreements. — Eighteen foreign governments were in debt to the United States at the close of the last fiscal year, and fourteen of these had reached funding agreements with this country. Only ten, however, had

actually delivered to the Treasury the obligations called for under the funding agreements: namely, Belgium, Estonia, Finland, Great Britain, Hungary, Italy, Latvia, Lithuania, Poland, and Rumania. Belgium delivered the new obligations during the last fiscal year. The four governments that had not yet delivered the new bonds were Greece, France, Czechoslovakia, and Yugoslavia. The French debt-funding agreement has not yet been ratified by the two governments, and the agreement with Yugoslavia was not ratified by the United States until March, 1928. Payments have, however, been received under all these agreements.

The Case of Greece.—The ratification of the agreement with Greece, which was concluded about a year ago, has been held up by the controversy over the provision for an additional loan of $12,000,000, which has been strongly opposed by certain groups in the American Congress, but which Greece claims is obligatory under the terms of the agreement reached in 1918 between Greece and several other Allied governmnts, including the United States. By the terms of the debt-funding agreement, Greece undertakes to forego all claims for further advances of capital from the United States that might be claimed under the 1918 treaty.

Debts Not Funded.—The four debts that have not been funded are those of Russia, Nicaragua, Armenia, and Austria. While a fifth—that of Serbia—is shown on the Treasury statement for June 30, 1928. It is covered by the funding agreement with Yugoslavia ratified last spring for which the new obligations had not been received at the end of the fiscal year. Austria has been granted a moratorium until June 1, 1943, by act of Congress. The settlement of the Nicaraguan debt has been negotiated independently of the Debt Funding Commission. Of the two other countries—Armenia and Russia—the first no longer has an independent government, while the government of the second has not been recognized by the United States.

FOREIGN GOVERNMENT SECURITIES

The securities of foreign governments owned by the United States Government fall under five categories. The first and largest of these, totaling $7,199,000,000, comprises bonds received under the debt-funding agreements, from the ten governments mentioned above as having delivered the new obligations. By far the largest of these debts are those of Great Britain and Italy, the former amounting to $4,480,000,000 and the latter to $2,027,000,000 on June 30, 1928. The second class, amounting to $3,202,000,000, consists of war loans extended under the Liberty Loan acts, of which $2,912,000,000 is owed by France. Although five debts are listed in this group, all but one—that of Russia—have been funded, although the new bonds have not yet been delivered. The three other groups, much smaller in amount, include (1) obligations received by the Treasury from the Secretary of War on account of sale of surplus war supplies, (2) obligations received from the American Relief Administration, and (3) obligations received from the United States Grain Corporation. The last two classes represent loans for relief purposes after the end of the war.

STATUS OF ALLIED DEBTS

The most important changes in the status of the Allied Debts to the United States during the last fiscal year were the conclusion of the funding agreement with Greece, the ratification of the agreement with Yugoslavia, and the receipt of the new bonds under the agreement with Belgium. Since the new Belgian bonds include accrued interest on the old debt, the nominal amount of Belgian indebtedness is increased from $370,000,000 to $411,000,000. On the other hand, the principal of the British debt is reduced from $4,505,000,000 to $4,480,000,000; that of the French debt, from $3,330,000,000 to $3,319,000,000; and that of the Italian debt, from $2,032,000,000 to $2,027,000,000. The amounts of the debts of other governments, aside from accrued interest, are unchanged, except for the debt of the Liberian Government,

which was paid in full on July 6, 1927.

It is seen, then, that the changes in the amounts owed by foreign governments to the United States during the last fiscal year were comparatively unimportant, the net reduction in the total principal being only $5,000,000.

Classification of Obligators.—The following table shows the classification and amounts of the obligations of foreign governments held by the United States Treasury on June 30, 1928, as compared with the totals a year earlier (in millions of dollars):

Country	Debt Funding Bonds	War Loan Obligations	War Supplies Obligations	Relief Obligations	Grain Obligations	Total, 1928	Total, 1927
Armenia				8	4	12	12
Austria					24	24	24
Belgium	411					411	377
Czechoslovakia		62	21	6	3	92	92
Estonia	14					14	14
Finland	9					9	9
France		2,912	407			3,319	3,330
Great Britain	4,480					4,480	4,505
Greece		15				15	15
Hungary	2					2	2
Italy	2,027					2,027	2,032
Latvia	6					6	6
Liberia						*	*
Lithuania	6					6	6
Nicaragua			*			*	*
Poland	179					179	179
Rumania	66					66	66
Russia		188	*	4		192	192
Serbia		26				26	26
Yugoslavia			25			25	25
Totals	7,199 †	3,202 †	454 †	19 †	31	10,905	10,912

* Less than one million.
† Slight discrepancies in totals due to omission of fractions.

STATE REVENUES, EXPENDITURES AND BUDGETS

By Merlin H. Hunter

Professor, University of Illinois

TREND OF STATE EXPENDITURES

Increase Rapid.—As a whole, the forty-eight states spend less than either the Federal Government or the cities, but the increase in the expenditures of the states has been more rapid than that of the cities. If the same trend continues, the states will

COMPARISON IN EXPENDITURES OF STATES, 1915-1926

(000 omitted)

Item	Expenditure		Increase Over 1915	
	1915	1926	Amount	Per Cent
General government	$ 44,508	$ 86,871	$ 42,360	95
Protection to person and property	26,295	59,747	33,452	127
Development and conservation of natural resources	16,359	62,696	46,137	278
Health and sanitation	9,454	25,549	16,895	170
Highways	22,768	156,639	133,871	588
Public institutions	89,189	178,580	89,391	100
Schools	145,832	413,074	267,242	183
Recreation	879	3,541	....	302

soon be spending more than 15 per cent of the total, as is now the case. A part of the increase is due to the fall in the purchasing power of money, a part to increased activity in particular lines, and a part to the change in the nature of some services. The actual trend over a period of years can best be pictured by statistical data. The preceding table is compiled from the publication of the Bureau of the Census, *Financial Statistics of States*.

Highways.—The table indicates that the greatest increase in state expenditures has been for highways. Not only has this been true for the states as a whole, but in some states the expenditure has so increased that it exceeds the expenditure for all other items. This is explained by the tremendous increase in the number of motor vehicles. Of the total expenditure, about 50 per cent was for maintenance and about 50 per cent for new construction. This ratio, however, did not hold uniformly throughout the country. In those parts where the highway construction program has been largely realized, the present maintenance charge is the larger item. Where an extensive construction program is being prosecuted, the maintenance costs fall far behind those for construction. About 15 per cent of the total is used for interest and payment on highway bonds.

The stimulus of the Federal Government to highway building has been continued. Allotments are made to aid the states in highway construction provided certain conditions are met by the states. The most important conditions are that the Federal funds be matched by the states and that the funds be expended upon a definitely connected system of roads.

Education.—State expenditures for education have continued to mount. Expenditures for certain types of education have been motivated by the possibility of receiving grants in aid from the Federal Government. Those states which maintain institutions of higher learning find these necessitate increasing outlays. The marked expansion in enrollment has not only called for a great increase in the expenditure for buildings and equipment, but also for operating costs. In addition to making direct expenditures for education, most states grant aid to the minor political units within it. The pressure is ever for a greater extension of this aid and repeated appeals are eventually heard. In some states the extension of aid to the public schools helps to account for the increase in educational costs. In many states this means that wealthier sections are being taxed to help develop and maintain the public schools in other sections.

Public Institutions.—The care of defectives, delinquents, and dependents is largely given to the states since the cities and Federal Government spend comparatively little for their care. These expenditures are the most discouraging of all those made by the states since they continue rapidly to increase, yet little progress seems to be made in eliminating the cause for this mass of "human culls." The decrease in purchasing power of money has, of course, had some effect on the increasing cost, but we have 25 per cent more in institutions caring for the feeble-minded, the insane, and delinquents than a decade ago. More humane and curative methods of treatment also add to the cost. When interest on the investment in building and equipment is considered, and Federal and local costs added to those of states, the annual charge of public institutions upon the people of the United States is not less than $360,000,000 a year.

Other State Expenditures.—While the total is not large, there has been a considerable increase in state expenditures for the conservation and development of natural resources. Most of this is for agricultural development in some form. Here, again, the Federal Government has been partially responsible by making possible grants in aid on certain conditions. In recent years forest fire prevention has commanded more attention from the states because of the possibility of Federal aid. The items falling under protection to person and property in the expenditures of the states are mostly of a regulatory

nature. Only a few states have a system of state police aside from those of the highway departments. Neither are the activities in providing health and sanitation important. The increase in the expenditures for recreation are largely explained by the increase in state parks found in a number of states.

STATE REVENUE

Sources of Funds.—The latest figures giving in detail the sources of revenue of all the states are, for 1926, found in the report of the Bureau of the Census, *Financial Statistics of States*. The total of the revenue receipts for 1926 was $1,655,495,000, distributed as follows:

REVENUE RECEIPTS OF STATES, 1926

(000 omitted)

General property taxes	$375,674	Subdivisions and grants	$139,149
Special property taxes	268,323	Highway privileges	76,265
Poll taxes	3,659	Earnings of general departments	129,289
Business and non-business taxes	616,629	Earnings of public service enterprises	10,894
Special assessments	28,107		
Fines, forfeits and escheats	7,507		

PERCENTAGE OF STATE RECEIPTS FROM DIFFERENT SOURCES

Year	Taxes				Earnings of General Departments	Subventions and Grants	All Others
	General Property	Special	Poll	Business and Non-business			
1926	22.7	16.2	0.2	37.2	7.8	8.4	7.5
1925	24.1	15.9	0.3	34.3	8.0	9.7	7.8
1924	25.7	16.6	0.3	31.8	8.3	9.8	7.7
1922	30.0	16.9	0.7	26.3	10.1	9.5	6.3
1919	35.1	18.2	0.3	24.5	12.3	2.5	7.0
1917	34.9	21.2	0.4	21.9	12.0	2.1	7.5
1915	40.6	18.2	0.7	20.3	11.0	1.6	7.6

Property Tax.—From these tables it appears that less emphasis is being placed upon the general property tax for state purposes. An analysis of the states shows that Pennsylvania had no receipts from the general property tax in 1926; California and North Carolina showed only receipts from levies of prior years; Delaware used it only for the support of its schools; Ohio used it only for the payment of maturing soldier-bonus bonds; New York used it only for debt service, common schools, and refunds for armories, courts, and stenographers; while Wisconsin taxed no property classed as real or personal. In many states the amount collected from property taxes was small, while in many property still remains the chief base for the levy of taxes. More than three-fourths of the amount under special property taxes came from Massachusetts, New York, Pennsylvania, Ohio, Michigan, and California.

Other Taxes.—Forty-five states, all except Florida, Alabama, and Nevada, continue to receive revenue from inheritance taxes. Twelve levy taxes on personal incomes. Business and license taxes show a decided increase. The two most important items here are the taxes on gasoline and the licenses on motor vehicles.

Subventions and Grants. — The amount from subventions and grants has also increased greatly. Some of the items included here are education, highways, agricultural extension, national guard, and vocational rehabilitation.

STATE LEGISLATION

Legislative Sessions.—Only nine states held regular sessions of the legislature in 1928, consequently the amount of legislative enactment was comparatively small. The states holding regular sessions were Kentucky, Louisiana, Massachusetts, New Jersey, New York, Rhode Island, South Carolina, and Virginia. Special sessions were held in New Hampshire,

Vermont and Oklahoma late in 1927, while Illinois, Nevada, Iowa, Wisconsin and California held them in 1928.

State Constitutional Changes.—Few constitutional changes were made during the year. By this method, Virginia gives the State Board of Equalization power to assess the property of electric light, heat, and power companies. By referendum Virginia placed in her constitution a provision which segregates the taxation of real estate and tangible personal property exclusively to the localities and intangible personal property exclusively to the states.

State Income Taxation.—California levied a tax of 4 per cent measured by the net income of business corporations with an off-set of personal tax receipts up to 90 per cent of the 4 per cent tax and a minimum tax of $25 for each corporation. This puts banks and other business corporations on a parity but the measure is subject to the will of the electorate. In New York taxes on profits or income paid to a foreign country may be deducted when computing the income tax on business firms.

Three states having income taxes made some changes. In New York, if a person is now married during the taxable year the personal exemption cannot be taken in full, but must be apportioned by the months married. If a taxpayer dies during the taxable year he is given full exemption and surviving spouse will receive exemptions according to status at end of year. A minister does not include in his gross income the rental value of a dwelling furnished him nor are pensions subject to personal income tax. In North Dakota the Tax Commission has ruled that stock dividends, under certain conditions, are subject to income tax. Wisconsin changed the amount of income below which a single person need not make return to 800, and to $1600 for a married person.

Tax Exemptions.—Some attention was given to tax exemption. In Massachusetts fishing equipment engaged exclusively in commercial fishing is exempt up to a value of $300. In Mississippi all cattle, sheep, goats and hogs are exempt from state and county general property tax for five years. In this state, also, hotels of twenty-five rooms or more built before January 1, 1932, are exempt from county and municipal taxation for five years from the date of the charter. Feed mills are made exempt from the general property tax for five years while buildings leased to exempt factories are also exempt. In New Jersey rural mail carriers are exempt from the gasoline tax up to 1500 gallons.

License Taxation.—Some changes have been made in license taxes. In Maryland and North Carolina the special license upon chain stores was declared unconstitutional. In South Carolina the tax on admissions is administered through the tickets being furnished without charge by the state, while the same scheme is used in collecting the tax on soft drinks. Bottles must be capped with a cap authorized by the state, and are evidence of the payment of the tax.

Motor Taxes.—In taxing motor vehicles Massachusetts made the only change worthy of note. The state now has an excise tax on registered motor vehicles in lieu of a local tax. This is laid on the privilege of operating motor vehicles on the highways while the new gasoline tax is an excise tax upon the privilege of registration. The value at which motor vehicles will be taxed is the same for each town; this is determined according to a definite schedule based upon age of the vehicle. The proceeds are for the general treasury of cities and towns.

State Gasoline Tax.—The gasoline tax is now found in all but two states, Illinois and New York. The Supreme Court of Illinois held that the tax enacted there was unconstitutional. In Kentucky the rate has been placed permanently at five cents a gallon. Massachusetts has had her first enactment of a gasoline tax with a two cent levy effective January 1, 1929. The proceeds go to the highway fund. In Mississippi, counties that issue bonds for the erection of sea walls for the protection of roads may levy a tax not to exceed three cents in addition to the state rate. In

New Hampshire the rate was raised from three to four cents, the increase to be used to pay interest and principal on bonds issued to repair flood damages. In Texas the rate was reduced to two cents.

GASOLINE TAX RATES

5 Cents		2 Cents
Arkansas	South Dakota	Connecticut
Florida	West Virginia	Kansas
Kentucky	3½ Cents	Louisiana
New Mexico	Utah	Massachusetts
South Carolina	3 Cents	Minnesota
4½ Cents	California	Nebraska
Virginia	Colorado	New Jersey
4 Cents	Delaware	North Dakota
Alabama	Indiana	Rhode Island
Arizona	Iowa	Texas
Georgia	Michigan	Washington
Idaho	Montana	Wisconsin
Maine	Ohio	District of Columbia
Maryland	Oklahoma	
Mississippi	Oregon	No Tax
Nevada	Pennsylvania	Illinois
New Hampshire	Tennessee	New York
North Carolina	Vermont	
	Wyoming	

State Inheritance Taxes.—Many states are still endeavoring to make the use of the inheritance tax more equitable, especially in its interstate aspects. Much emphasis is still being placed upon the desirability of furthering reciprocity between states. Within the last year Mississippi, New York, and Virginia have provided for reciprocity. New York also made her estate tax to apply to all amounts of more than $200,000. The simplest form of reciprocity is for a state to exempt the intangible personal property of non-resident decedents. The movement has made great strides and at present twenty-three states have some form of effective reciprocity.

STATE TAX COMMISSIONS

Equalizing the Tax Burden.—State tax commissions, both the regular commissions and those appointed for a particular purpose, have been active. The regular commissions have been attempting to find methods for equalizing the tax burden, especially on property. The Illinois Tax Commission, for example, has ordered many reassessments, the most important being the entire reassessment of all real estate in Cook County, the county in which is located the city of Chicago.

Proposed Changes.—Some special commissions have made reports and others are at work. The Massachusetts special commission reported its findings but has been continued. The California commission, with Robert M. Haig as adviser, also made a comprehensive report upon the basis of which many changes will be attempted. Special commissions are still at work in Iowa, North Carolina, New York, Illinois, Oregon, Virginia, Arkansas, Maryland, and some other states.

TAXPAYERS' ORGANIZATION

The interest of taxpayers is indicated by the number of organizations for the purpose of studying conditions and bringing about desirable changes in administration and legislation. The most used methods for accomplishing the aims of the tax associations have been through publicity, coöperation with public officials, the formation of study groups and in some cases in court action. Publicity is carried on through furnisning items of a general interest to the newspapers and through printing and distributing pamphlets and leaflets. The California Taxpayers Association publishes a monthly magazine, *The Tax Digest.*

Tax associations of state-wide scope are found in more than twenty states, widely scattered. Many of these organizations have fostered the organization and work of many local organizations. Other organizations, such as the bureau of research, the Chamber of Commerce of the United States, the National Industrial Conference Board, and the National Tax Association, have shown considerable interest in the study of fiscal problems of the states.

STATE BUDGETS AND ADMINISTRATION

No radical changes have occurred in the use of the budget by the states or in the administrative procedure. Some form of budget is in use in most of the states and many have

adopted modern business practices in administering the finances. Among these are the centralization of management in one department, the centralized purchasing of supplies, and in the audit of books.

CITY FINANCE

By Merlin H. Hunter

Professor, University of Illinois

TREND OF MUNICIPAL EXPENDITURES

Per Capita Cost.—The trend of municipal expenditures continues upward. In 1903 the per capita expenditures of the cities of the United States with a population of 30,000 or over were about $16.50. In 1926, the last year for which statistics are available, the per capita expenditure was about $50.30. The trend of the different types of expenditure may be seen from the following table, modified somewhat with respect to the table given in the *Financial Statistics of Cities*, 1926.

GOVERNMENTAL-COST PAYMENT OF CITIES

(000 omitted)

Year	Total		Operation and Maintenance		Interest		Outlays	
	Amount	% Increase over 1903	Amount	% Increase over 1903	Amount	% Increase over 1903	Amount	% Increase over 1903
1926	$2,651,628	415.7	$1,600,787	434.7	$218,100	406.6	$832,740	384.9
1925	2,549,149	395.8	1,503,038	401.3	198,082	360.1	850,028	395.0
1924	2,304,696	364.2	1,410,579	371.1	181,438	321.4	712,678	315.0
1923	2,066,234	327.6	1,323,709	342.1	172,343	300.3	570,132	232.0
1922	1,984,322	310.2	1,248,986	317.2	194,584	351.9	540,752	214.9
1915	996,062	97.0	586,791	96.0	103,387	140.1	305,883	77.9
1909	663,380	51.1	434,009	45.0	71,857	66.9	255,696	48.9
1907	568,779	29.5	393,022	31.3	59,200	37.5	238,849	39.1
1905	498,837	13.6	327,050	9.2	51,898	20.5	182,825	6.5
1903	439,127	...	299,403	...	43,055	...	171,732	...

Operation and Maintenance Cost.—From this table it will be seen that the expenditures for operation and maintenance since 1903 show an unbroken chain of increases. With not one exception this is also true of the expenditures for interest. In the expenditure for outlays the chain of increases has not been so intact for it was broken in the period from 1911 to 1913, from 1915 to 1917, and from 1917 to 1919.

Analysis of Expenditures.—This rapid and tremendous increase does not necessarily mean that the cities are undertaking new functions or performing the old ones better. Mere increase in population, after cities reach the 30,000 population mark, is shown by the statistics of expenditure to call forth a larger per capita cost for each municipal function. This increase in population may account for a part of the upward trend in expenditures, but a factor of much greater importance is the change in the general price level. If the index of wholesale prices be taken for different periods, using 1913 as a base, then the dollar in 1925 was worth in purchasing power only about sixty-five cents. This is probably a little low for municipal expenditures since a larger part is for wages and salaries and such costs do not rise to the level of commodity prices in general. But if the wholesale index is considered, then the actual per capita

increase in municipal expenditures from 1915 to 1925 was from $30 to $39, or about 30 per cent instead of more than 100 per cent as at first appears.

Expenditures as Related to Municipal Functions.—The general increase in municipal expenditures, of course, is but a composite of the increase for the separate items of expenditure. The total amount spent for these items together with the per capita expenditure is shown in the following table. If a study were made on the basis of the size of the city it would, in general, be found that per capita expenditures increase with the size of the city, although those for some items increase rapidly than others. Thus the per capita expenses for schools, although they increase with the size of the cities, do not increase as rapidly as other per capita expenditures. The following table shows the total per capita and percentage of the total of municipal expenditures for the different functions for particular years.

FUNCTIONAL EXPENDITURES FOR PARTICULAR YEARS

(*Total, Per Capita, and Percentage Total*)

(000 omitted)

Item	1926			1925			1903		
	Total	Per Capita	% of Total	Total	Per Capita	% of Total	Total	Per Capita	% of Total
General Government	$128,365	$3.32	8.5	$119,785	$3.16	8.5	$30,842	$1.46	11.1
Protection to Person and Property	295,256	7.77	19.9	278,056	7.46	20.0	71,021	3.35	25.3
Health and Sanitation	148,658	3.90	10.0	140,376	3.75	10.1	25,808	1.21	12.4
Highways	132,322	3.55	9.1	117,693	3.21	8.6	34,209	1.64	12.4
Charities, Hospitals and Corrections	89,988	2.29	5.9	84,858	2.19	5.9	18,281	0.86	6.5
Schools	528,986	14.49	37.2	502,239	14.10	37.6	80,854	3.86	29.3
Libraries	18,666	0.50	1.3	17,379	0.48	1.3	4,068	0.19	1.5
Recreation	50,427	1.34	3.4	44,886	1.22	3.3	7,457	0.35	2.7

Factors in Functional Expenditures.—While this increase has been general and much more rapid in recent years than for earlier ones, the generalization would not hold for individual cities nor accurately for cities in the different groups. If individual cities were studied, a wide variation in the increase of expenditures would be noted into an explanation of which a number of factors might enter. Among them, aside from mere size, would be age, rapidity of growth, climatic and topographic conditions and the spirit of progress and development of civic pride found in the inhabitants. Thus in New York the per capita expenditures, over the period of the last ten years, increased some 50 per cent; those in Detroit about 70 per cent; those in Cleveland about 30 per cent; those in Buffalo about 55 per cent; while in some cities it is possible to find only slight increases or even decreases. It must be remembered that these figures are based on per capita expenditures, and, since the population of the cities is increasing, the increase in total expenditures would be more than they would indicate. It is interesting to note that a larger percentage of municipal expenditures goes for schools than formerly, while a smaller percentage is used for protection to person and property, general government, and highways.

Public Service Expenditures.—Under public service enterprises are included those enterprises or branches of municipal service which are established and maintained by city governments for the purpose of providing the public, or the public and the city, with some utility or service, such as water, electricity, heat or gas. Of these the water supply system is the most important public service enterprise operated by cities. The expenditures for these water supply systems for specific years are shown in the following table (see p. 194).

EXPENDITURES FOR WATER SUPPLY SYSTEMS

(000 omitted)

Year	Total	Operation and Maintenance	Outlays
1926.....	$164,878	$69,173	$95,705
1925.....	163,525	64,806	98,719
1919.....	80,675	41,686	38,988
1915.....	76,609	30,218	46,391
1909.....	76,452	25,519	52,933
1904.....	41,582	18,677	22,904

MUNICIPAL REVENUES

Rapid Increase.—The tremendous growth in municipal expenditures can, in the end, only be met through an increase in revenues. That this increase has been rapid is shown by statistics covering a period of years. The following table gives the receipts for specific years together with the percentage increase over 1903.

SOURCES OF MUNICIPAL REVENUE

(Per Capita and Per Cent of Total)

Year	General Property Tax		Other Taxes		Special Assessment		Subventions and Grants		Public Service Enterprise		Other Sources	
	Per Capita	% of Total	Per Capita	% of Total	Per Capita	% of Total	Per Capita	% of Total	Per Capita	% of Total	Per Capita	% of Total
1926....	$43.46	65.7	$3.90	5.9	$4.75	7.2	$3.23	4.9	$6.60	10.0	$4.20	6.4
1925....	40.62	65.6	3.62	5.8	4.30	6.9	3.14	5.1	6.19	10.	4.02	6.5
1922....	35.85	66.9	2.80	5.14	2.58	5.3	3.13	5.4	4.83	10.4	4.38	7.3
1915....	18.73	62.4	2.36	7.8	2.54	8.5	1.26	4.2	3.03	10.0	2.08	6.9
1911....	17.37	61.9	2.44	8.7	2.35	8.4	1.30	4.9	2.98	10.9	1.63	5.8
1907....	14.64	59.4	2.63	10.6	2.02	8.2	1.18	4.8	2.77	11.2	1.43	5.8
1903....	12.98	61.4	2.06	9.8	1.60	7.6	0.91	4.3	2.42	11.5	1.16	5.5

Tax Levies.—Under the item "other taxes" is included the many taxes which are not of the nature of the general property tax. Such are those levied upon corporation stocks and bonds, or those levied upon life insurance companies. Any inheritance or income receipts are also so classed. In addition, especially in the southern cities, there are a large number of levies on business organizations.

In some cities poll taxes are levied at a fixed amount per capita while in others they are graded according to the occupation of the individual, and are assessed at the rate for the general property tax. A total of a little more than $5,000,000 was collected from poll taxes in 1926. A total of some $52,000,000 was derived from taxes levied upon business. Most cities participated in subventions and grants from other political divisions. The total from this source was about $110,000,000, about 90 per cent of which was for education. The most important of the receipts from non-business license taxes is from the levies upon automobiles. This is an item of increasing importance, the city of Chicago alone realizing more than $4,000,000 from this source in 1926.

Public Service Returns.—The items under public service enterprises include the net returns from municipally owned plants such as those supplying water, gas, or electricity. The most general of the municipally owned plants are those for supplying water. In general, the statistics of revenue from these enterprises are inaccurate since no good plan of cost accounting is in force. The enterprises are frequently not credited with all the revenue that actually has arisen within them or debited with all the expenses which should be allocated to them.

Of the total value of public service enterprises over 67 per cent represents the value of water supply systems; 5 per cent the value of electric light and power and gas supply systems; 1.8 per cent the value of markets; while the remainder is composed of the value of such items as public halls, subways for pipes and wires, railways, toll bridges, ferries, and farms.

Income from Municipal Property.—Practically every city owns some

property, either as land or buildings used in connection with the general departments of the land, buildings, or equipment of the public service enterprises. The property of the first type is for the most part unproductive, any income being incidental; that of the public service enterprises is productive, usually producing a revenue equal to the cost of operation and sometimes in excess of this. The values as reported for the property of the general departments is very inaccurate. Of that reported, the property first in importance is that of schools, while that used for recreational purposes follows.

ADMINISTRATION OF PROPERTY TAX

Where the general property tax is still in use its administration is extremely difficult and very unsatisfactory. The personal property, both tangible and intangible, is listed to only a small extent and at a small fraction of its true value. Most of the tax burden falls upon real estate and even here the assessments are frequently very far from uniform. It has frequently been shown that the urban valuations are at a much lower percentage of true value than rural assessments which has caused a disproportionate tax burden upon the latter class of property. Because of this many complaints have been registered, followed, in some cases, in order for reassessment, from central authorities with the hope of equalizing the burden. In some cities, also, the attempt has been made to solve the difficulties of assessment through the adoption of scientific methods which will, to the greatest extent possible, eliminate the personal element.

MUNICIPAL INDEBTEDNESS

Increase in Borrowing. — The growth of municipal indebtedness continues even though it has reached alarming proportions. To borrow rather than resort to taxes appears to be an easy method to provide funds, and many cities are seeking, through the creation of special districts or otherwise, to circumvent the limitation upon their borrowing which some states impose. The following table shows the growth in the actual and per capita gross indebtedness of cities for certain years.

TOTAL AND PER CAPITA INDEBTEDNESS OF CITIES

(000 omitted)

Year	Amount	Per Capita	Year	Amount	Per Capita
1926	$6,643,467	$183.73	1912	$2,731,183	$97.16
1925	6,108,873	172.09	1909	2,200,176	87.63
1919	3,678,254	117.51	1905	1,609,158	73.23
1915	3,147,762	109.13	1903	1,395,710	66.88

Debt Classification.—The gross indebtedness signifies the aggregate of all outstanding debt obligations while the net indebtedness would be this amount less the assets accumulated for its amortization. The most important classes of the public debt are funded or fixed, floating, special assessment indebtedness, and current indebtedness. The fixed debt includes all debts evidenced by formal instruments which have a number of years to run. The floating debt is made up of a number of items all of which are of short duration while the special assessment debt is that to be paid from the proceeds of special assessments. That the sinking fund is not making any large provision for the payment of the debt is evident when it is noted that against a total fixed and floating debt of over $6,000,000,000 the sinking fund amounts to less than $1,500,000,000.

ADMINISTRATION OF MUNICIPAL FUNDS

One of the hopeful indications in municipal finance is the introduction of business-like methods in the administration of funds. The budget system has become general in its use, and each year sees it reaching more nearly perfection. The centrali-

zation of purchase of supplies, where it is being efficiently used, is responsible for a considerable saving. The systematic and regular audit of accounts, sometimes by an outside firm, has been responsible for much greater regularity in the conduct of municipal finances. One may expect such practices to be adopted by more cities and to be better used by the cities now having them. Economies arising therefrom may be one antidote for the rapidly rising expenditures.

TAX LEGISLATION

By Beulah Bailey

Librarian, New York State Department of Taxation and Finance

ADMINISTRATION

Legislative Sessions.—During 1928, legislatures of nine states were in regular session,—Massachusetts, New Jersey, New York, Rhode Island, South Carolina, Kentucky, Louisiana, Mississippi and Virginia. The legislatures of Illinois, Nevada, Iowa, Kansas, Wisconsin and California were in special session. New Hampshire and Vermont called special sessions in November, 1927, and Oklahoma in December.

Virginia Tax Code.—In 1926, a Commission was created in Virginia to make a study of, and to revise and codify the general tax laws of the state. The Commission reported this year and the result is "The Tax Code of Virginia." The code decreases the volume of the tax statutes by about 50%. This year in Virginia there was embodied in the Constitution by referendum the segregation of the tax sources. The localities will have real estate and tangible personalty, while the state will have intangible personality.

New York and New Jersey Changes.—In New York, the state tax sale for unpaid real property taxes was abolished. New Jersey amended its Tax Sale Act. The maximum fees payable in redeeming property are increased from $10 to $12. A chance at compromise is given if the amount of taxes due exceeds the value of the property. If the amount due is less than $10, the property must be sold where taxes are unpaid for three years.

Real Estate Assessment.—In Illinois, the State Tax Commission has ordered the re-assessment of all real estate. This work is to cover the 1928 taxes payable in 1929 and to extend to 1931.

SPECIAL COMMISSIONS

New Jersey is the only state this year to create a special tax commission for study. The subject is the personal property tax. Massachusetts and New York continue their special commissions. The reports of special commissions published during the last year are Massachusetts, "Report of the Special Commission Appointed to Investigate the Entire Subject of State, County and Local Taxation and Revenues from Fees and Other Sources, December, 1927"; New York, "Fiscal Problems of City School Administration, 1928"; California, "Special Report of the California Tax Commission Dealing with the Taxation of Banks, Corporate Franchises, Securities and Solvent Credits, 1928"; and the before mentioned Virginia report.

FINANCIAL AND INDUSTRIAL TAXES

Banks and Trust Companies.—Virginia has reduced its bank stock tax from $1.10 to $1.00 on $100 of actual cash value. In New York State, the income tax on banks and trust companies was amended in regard to the pro rata payments by new corporations or in cases of mergers or dissolutions. In Kentucky, the mortgage registry tax was declared unconstitutional and in California, the low rate tax on intangibles. California, at a special session in September, passed a bank tax measure which was adopted

by the electorate in November. This provides for a 4% tax "according to or measured by" net income. This tax is in lieu of all other personal property taxes on banks. It is estimated that the yield of this tax will be about ⅛ of the yield of the capital stock tax. The measure also provides for a 3 mill flat tax on credits to take the place of the previously mentioned low rate tax on certain intangibles, which was held unconstitutional.

Corporations.—Another law provides for a 4% tax measured by net income on business corporations with an offset by personal property tax receipts up to 90% of the 4% tax and a minimum tax of $25 for each individual corporation. The tax on corporation excess was repealed. These new laws place all business corporations and all financial corporations other than banks on a parity with banks.

GASOLINE TAX

In 1927, $187,500,000 were collected from the gasoline tax and in 1928, $259,000,000. New Hampshire at the special session increased its tax from 3 to 4 cents. The additional cent will be used to pay the interest and principal of the flood bonds. The 4 cent tax is to be levied for 8 years or less if the bonds are redeemed before that time. Virginia raised its tax from 4½ cents per gallon to 5 cents. Kansas has had a gasoline tax since 1925 but its constitutionality has been questioned. This year a constitutional amendment was adopted by the electorate permitting the state to levy special taxes for road and highway purposes on motor vehicles and motor fuels. The Illinois tax on gasoline was held unconstitutional. Although Illinois had three special sessions during 1928, no new gas tax was enacted. In Massachusetts, a 2 cent tax on gasoline becomes effective January 1, 1929; the usual exemptions are granted. The tax is paid monthly to the state by the distributors. The Department of Corporations and Taxation administers the tax and the money will go to a "highway fund" to be expended by the Department of Public Works. Massachusetts also levies a new excise tax on motor vehicles in place of the personal property tax, and reduces the registration fees by about 70%.

INCOME AND INHERITANCE TAXES

There are only minor changes in the income tax. In New York, the exemption for married people is pro rated if the marital state is changed during the year. In Wisconsin, the minimum income demanding reports has been increased from $1500 to $1600 for married people and from $700 to $800 for single.

New York again has reciprocity. The law effective March 12, 1928, is retroactive to July 1, 1925,—New York's original date of reciprocity. All the reciprocal states but Ohio, Pennsylvania and Maryland have accepted this retroactive provision: with them, it is of March 12, 1928. Mississippi's reciprocity became effective April 22, 1928, and Virginia's will be of January 1, 1929, by the non-taxing of intangible personalty of non-residents. Maine's reciprocal law passed in 1927 became effective July 1, 1928. Mississippi increased the amount of deduction from the gross estate from $25,000 to $100,000. In New York the estate tax is amended to apply to estates of over $200,000 instead of $1,000,000.

TAX LAWS HELD UNCONSTITUTIONAL

Foreign Corporation License.—Many laws, in addition to the ones already mentioned, have been held unconstitutional during the past year. In New York State, the Appellate Division held unconstitutional the license tax on foreign corporations whose issued capital stock has no designated monetary value. The tax was 6 cents on each share employed in the state.

Chain Stores.—A tax of $50 per store on all chain stores was held unconstitutional in North Carolina, and one of $500 was held unconstitutional in Allegany County, Maryland. South Carolina this year levies an additional license tax of a hundred dollars per store on all chain stores.

Miscellaneous.—Last year, in Montana, a license tax was levied for the privilege of grazing live stock brought into the state. This year it was held unconstitutional. In Utah, the law requiring foreign corporations to pay an annual tax based on the entire authorized capital stock of the corporation was held unconstitutional. In the state of Washington, a similar case was held constitutional. The United States Supreme Court held unconstitutional a Pennsylvania law taxing gross receipts of corporations transporting passengers.

Pre-Enactment Opinion.—In Massachusetts, it is possible to ask for the opinion of the Justices on the constitutionality of an act before it becomes an enforced law. In view of all the tax laws that have been held unconstitutional this year, it would be expedient if other states would take this same precaution.

LAND AND PROPERTY TAXES

By Jens P. Jensen

Professor, University of Kansas

Only nine state legislatures have been in regular session and the grist of tax laws is relatively limited in scope. Though there has been the usually long list of litigation affecting property taxation, decisions of first magnitude do not occur. Investigation by special tax commissions, owing to the large number of such commissions created in 1927, have been carried on, and some creditable reports have been made, although most of the investigations are not yet completed. The New York Special Committee on Retrenchment and Taxation was continued, and has apparently become a permanent feature. In addition, New Jersey and Massachusetts appointed special tax commissions.

GENERAL PROPERTY TAXES

Rates and Levies.—Apparently property taxes, considered as a whole, continue to increase. It is the numerous local levies that raise the bulk of property tax revenue. But even the state rates show no tendency to decline. The New York rate was reduced from 1 mill to 0.5 mill. In New Jersey the 0.5 mill tax on general property, first levied in 1926 for the use of the state institutions construction fund, was continued. In Nevada the rate increased from 5.8 mills to 6.3 mills; and there was levied, in addition, a 0.5 mill tax to supplement the Federal aid money in maintaining highways. In the states where the tax rate is computed as the quotient of the revenue required and the assessed valuation, no perceptible net change has occurred in the reliance of the state upon property taxes. In Illinois alone, a drastic statutory rate limitation occurred, in some cases as much as 50%. But this is due to the change in the assessed valuation of from a 50% to a 100% statutory basis. It may not result in a decrease in the taxes.

Administrative Changes. — Only minor administrative changes occurred. Kentucky increased the pay of the supervisors from $3.00 to $4.00 per day. New Jersey provided for a board of three assessors in fourth class cities, merely to correct an irregularity in the 1926 act. The "Tax Code of Virginia" was completed and adopted, reducing the volume of tax laws by 50%, and eliminating obsolete, useless, and duplicating provisions.

ASSESSMENT

Central.—In North Dakota the constitution was amended giving the state board of equalization power to assess electric light, heat and power companies. Kentucky extended the tax commission's assessment to include the physical property of inter-county electric light and gas companies. In Oklahoma the authority of the state board of equalization to assess the

property of companies transporting oil for others through their pipe lines was sustained (264 Pac. 160), even though refining was the principal business.

Reassessment.—The Illinois state tax commission ordered the board of assessors of Cook County (Chicago) to reassess all real property in the county. The change in the assessment ratio from 50% to 100% of the value was perhaps the occasion for the order, which was precipitated by extreme inequalities in the assessment shown in a study sponsored by the Institute of Land and Public Utilities Economics, and other similar studies. In New Mexico the courts upheld (240 Pac. 988) the authority of the tax commission to send its own agents into a county to reassess property, and charge the cost to the county. Elsewhere the power of reassessment is but seldom exercised.

Railroad Assessment.—In Kentucky the rule of assessing railroad property as a unit was required (12 Fed. (2d) 802 D. C.) to be supplemented by further analysis, for purposes of assessing the franchise value. After obtaining the unit value by capitalizing the entire net income of the railroad, and deducting the value of the tangible property, the remainder was distributed on a mileage basis. The road used only a small percentage of its mileage in Kentucky for freight transportation, all being used for passenger transportation. Since freight transportation is the more profitable of the two, this formula yielded an excessive value for Kentucky; and the court required separate computation, the income from passenger transportation being shown separately.

An interesting complication arose in California. Property of the Central Pacific Railroad Company was assessed in two counties for the same year. Taxpayers paid the tax in one county and protested the assessment in the other. The statute requires, in such a case, the second county to cancel the assessment regardless of the situs of the property (258 Pac. 991). Under this rule it would seem that, by some connivance, the taxpayer could select a low rate county in which to pay his taxes.

Assessment Ratio.—The Arkansas courts (2 S. W. (2d) 25) required the use of a fractional assessment ratio, below the 50% ratio required by order of the tax commission. In assessing for back taxes for 1915-1925 the state argued for the 50% ratio. But since other property had in fact been assessed at about 30% of its full value, the court ordered the use of this ratio for purposes of the back taxes in question. A case involving a similar issue is pending in Nebraska.

NEW TAXES

Petroleum in Transit.—A Kentucky tax of 1% of the market value of all crude petroleum, though being an exclusive property, was collectible from the pipe lines, and did not attach until the oil reached the pipe lines, and was for the latter reason void (17 Fed. (2d) 394 D. C.) as being in violation of the commerce clause of the Federal Constitution, although the pipe lines were reimbursable from the producers. But in Louisiana, oil transported to and held in tanks, and afterwards sold and piped for refining in another state, was taxable, the interstate movement being broken and the oil at rest for purposes of taxation.

New York Special Franchise Tax.—The New York tax on the privilege of carrying on business on, over, under, or through any public street, public highway, public place, or public waters, which is created a special franchise, is encountering difficulties. A number of cases have been in the courts to determine whether or not a franchise actually exists (E. G. 221 N. Y. Supp. 613, and 155 N. E. 911). There is also difficulty in appraising such special franchises, as that issue is raised and discussed at length in Hudson ex rel. Central Hudson Gas and Electric Company V. State Tax Commission (219 N. Y. Supp. 445). The public utilities interests find the tax particularly obnoxious.

Gross Receipts Taxes.—The United States Supreme Court has finally upheld, January 3, 1928, the circuit

court decision that the California gross earnings tax applies to the earnings from leased as well as owned property used in operation, and thereby exempts the leased property from taxation to the owner. The local assessors attempted to tax certain leased apparatus to the owners, under a rigid interpretation of the statute which states that these companies are taxable on *their* property. In Minnesota it was held (216 N. W. 542) that the 8% gross earnings tax on express companies, which is an exclusive property tax, does not permit the imposition of a registration tax on motor vehicles used by the express companies. The latter tax is partly a property tax and partly a privilege tax. Though the state might impose a privilege tax, the two elements are inseparable in the registration tax. Hence the entire tax is invalid.

EXEMPTIONS

Veterans.—Exemptions continue to be accorded for a variety of reasons. Attempts to draw the distinction between exempt and taxable property continue to be productive of considerable litigation. Rhode Island extended the customary veterans' exemptions to veterans of the Philippine Insurrection and the China Relief Expedition.

Schools.—In Illinois gifts for educational purposes are exempt, and the proceeds therefrom, whether held in trust or owned outright. However, under the old law, the courts of Illinois denied exemption (159 N. E. 811) to a student loan fund administered by the University of Illinois. The United States Supreme Court upheld the Mississippi state courts in denying exemption to real estate, not a part of the school plant of Millsaps College. Though the "endowment" of the college is exempt in the charter, the real estate in dispute is not a part of the endowment. In property of educational and religious agencies the use of the property is generally the controlling factor.

Industrial Exemptions.—Exemptions for purposes of industrial encouragement are the most striking development. Massachusetts exempted equipment of commercial fishing to the extent of $300. At the same time it made real estate of a municipality not used for public purposes taxable to the lessee. And the state supreme court advised the senate (159 N. E. 55) that the legislature might exempt bonds issued by the trustees for the state of the Boston Elevated Railway, but having granted such exemption, the legislature could not revoke it for issues thereunder. Mississippi vigorously applied tax exemption as a device for industrial development by exempting live stock, hotels of 25 rooms or more, feed mills, and buildings erected for lease to exempt corporations for five years from certain property taxes. The difficulties involved in drawing the line is illustrated in a Georgia case (140 S. E. 860) where exemption was vainly sought for a building acquired as a warehouse, under a provision to exempt enlargements of plants for manufacturing or processing cotton.

Tobacco.—A Kentucky tobacco growers association marketing tobacco for its members was held (300 S. W. 350) not liable for taxes on tobacco in its possession, being merely a sales agent for its members. Presumably the tobacco is taxable to the owners, but undoubtedly very little of it will be assessed in that way.

TAX ADJUSTMENT

Remission of Taxes.—It is not often that taxes are remitted, though they are often delinquent and uncollected. Because of a bad fire in the city of Astoria, Oregon, the state legislature voted to remit all state taxes. It was contended (264 Pac. 445) that this remission included income and excise and other taxes as well as property taxes. But the court held that with strict construction the law limited the remission to property taxes. The same city, in order to encourage the location of a box and paper plant proposed to remit the tax liens aganist certain property. But the court held (259 Pac. 908) such remission an unwarranted preference to some persons against others similarly situated.

Collection.—For the improved collection of delinquent taxes only minor tinkering has occurred. The New York tax sale act was changed, abolishing the sale by the state of tax-delinquent realty. The county treasurer now must conduct the sale. More elaborate but still minor changes were made in the New Jersey tax sale law.

CLASSIFIED PROPERTY TAXES

Legislation.—There was no increase in the number of states that may constitutionally classify property for taxation, nor was there any statutory laws increasing the scope of classification. But several states have been in trouble with such classification as they have had.

Zoning in Asheville.—An abortive attempt on the part of Asheville, Ga., to adopt a zoning system with differential tax rates was held invalid (138 S. E. 715). The proposed plan would create three areas: the first and central area, enjoying full municipal benefits and advantages, would be subject to the full rate; at the other extreme was the third class of land, valuable chiefly for factory sites, and being of a semi-rural character, subject to ¼ of the full rate; while realty of an intermediate character would be subject to ½ of the full rate. The court held this zoning system to violate the uniformity rule of the constitution.

Intangibles.—The 7% assessment ratio in California established in 1925, under the 1924 constitutional amendment, was replaced in 1927 by a tax of 14.5 mills on the full value of intangibles generally. Both of these laws were held invalid (265 Pac. 223), though probably not for reasons incurable. The acts did not comply with the constitutional amendment under which they were enacted. The 1925 act merely specified a basis of assessment and did not provide a system of taxation as the amendment required. The 1927 act assigned the revenue to the general fund of "the county or city and county" in which the property was taxed. It did not, as the amendment was held to require, "provide for an equitable distribution—to the county, municipality or district." The decision seemed to turn upon the interpretation of the word "or," and the court decided that in this case it meant "and." This decision would make the general property tax, as before 1925, effective. But a special session of the legislature imposed a 3 mill tax on intangibles generally that contrasts sharply with the 1927 tax of 14.5 mills, which evidently was too high.

Virginia.—As a result of the investigation made by the special tax commission it was found that railroads had been undertaxed. Their intangible property was made taxable by a law passed in 1927. At the same time other changes took place in the mill-tax rates. The taxes on shares of stock, including those held in a fiduciary relation, at the rate of 5 mills, and on public bonds, at the rate of 3 mills, were repealed. The tax on capital was reduced from 8.5 mills to 7.5 mills. The statutory provision of 1926, segregating real estate and tangible personalty for taxation by the localities, and intangibles exclusively by the state, was by referendum embodied in the constitution.

Kentucky.—The Kentucky mortgage recording tax of 2 mills was held unconstitutional (281 S. W. 1017) on the ground that, since it applied only to those documents having maturity of 5 years or more, it was discriminatory as between instruments of different maturities.

MOTOR VEHICLES

Massachusetts provides for a new way of taxing motor vehicles, which is not new except in this particular application. In addition to an excise tax upon the privilege of registering motor vehicles, a statutory schedule of valuation is possible for this assessment. During the first year, 90% of the manufacturers' price list is to be the value. This value is to decline for each of the following years to 60%, 40%, 25% and 10%, respectively, of the price list, the lowest figure of 10% being retained as long as the vehicle is assessed. Registration is made in duplicate and one

copy sent to the local assessor. The revenue is retained for local purposes. The registration fee, as distinct from the excise tax upon the privilege of registration, is retained, but is reduced by about 70%.

MINING AND SEVERANCE TAXES

Utah.—Prior to 1919 Utah mines were taxed on their net proceeds only. In 1914 a mine was closed as being worked out. On the ground, however, the owner established a reduction plant for ore shipped in, and developed a tailing dump. He made an agreement with another concern to treat the tailings, and was to receive 10% of the proceeds. In 1919 the company successfully resisted a tax on the proceeds. The officials then attempted to assess the company on the tailings as property for back taxes. But the court held (17 Fed. (2d) 577 (C. C. A.)) that the tailings were the products of mines and therefore not subject to property taxes. Thus neither proceeds taxes nor property taxes could be collected.

Louisiana.—There is evident in several states a movement for extending the scope of the taxes on the privilege of severing natural resources. Louisiana imposed a tax of 4 cents per barrel on crude oil of 28 gravity and above, and of 11 cents per barrel on 43 gravity and above.

THE INCOME TAX

By Mabel Newcomer

Professor, Vassar College

FEDERAL INCOME TAX PROVISIONS

Rates and Reductions.—Tax reduction is confidently anticipated with every revision of the Federal income tax, and the Revenue Act of 1928 meets this expectation with still further reductions. Unlike the three preceding revenue acts, however, the reductions are in the corporation income tax rate, rather than in personal income tax rates. No important changes have been made in the personal income tax. The rates remain the same as those provided by the Revenue Act of 1926. Normal rates are 1.5 per cent on the first $4,000 of taxable income, 3 per cent on the next $4,000, and 5 per cent on all over $8,000. The surtax rates begin with 1 per cent on net income in excess of $10,000 and reach a maximum of 20 per cent on net income in excess of $100,000.

Credits and Exemptions.—A credit of 25 per cent of the normal tax is allowed on all net income under $5,000 and on "earned" net income under $30,000. The amount of earned net income on which this credit is permitted was increased from $20,000 to $30,000 by the 1928 act. The estimated reduction in the yield of the tax, in consequence of this change, is relatively small. Personal exemptions remain at $1,500 for single persons, $3,500 for heads of families, and $400 for dependents. The exemption for estates and trusts is $1,500.

The corporation income tax rate has been reduced by the 1928 act from 13.5 per cent to 12 per cent, the reduction to take effect for 1928 income. It is estimated that this will reduce the yield of the tax by more than $100,000,000. Further, the specific credit granted to domestic corporations with a net income of $25,000 or less is increased by this act from $2,000 to $3,000. This will cut the yield of the tax, it is estimated, from ten to fifteen million more. Corporations will, consequently, benefit materially by these changes.

REVENUE FROM FEDERAL TAX

The rates on personal income were the same for the fiscal year ended June 30, 1928, as for the preceding year. Nevertheless, there was a marked decrease in the yield of the tax. The corporation income rate was 13.5 per cent for all of the payments made during the fiscal year ending

June 30, 1928. For the preceding fiscal year it was slightly less, being 13.5 per cent for the March and June payments, and 13 per cent for the September and December payments. In spite of this small increase in the rate of the tax the yield was considerably lower than in the year before. The income tax collections for the first quarter of the year 1928-29 were $7,000,000 less than the collections for the same quarter of the preceding year. The comparative totals are as follows:

(In thousands of dollars)

Fiscal Year	Corporation	Personal	Total	Per Cent of All Federal Taxes from Income Tax
1927-28	$1,291,846	$882,727	$2,174,573	64.6
1926-27	1,308,013	911,940	2,219,954	63.1

Rate Outlook.—Further reductions in income tax rates may come with further debt reduction and consequent decreased interest charges. With the increase in other Federal expenditures, however, and the temporary decline in taxable income, the prospects for further substantial reductions in income tax rates are not very bright.

STATE INCOME TAXES

Changes in Laws.—Very few changes have occurred in state income taxes. A constitutional amendment providing for a personal income tax in Oregon was again defeated at the November, 1928 election. In California an amendment providing for a 4 per cent net income tax on banks and business corporations was passed at the November election. This will be levied first in March, 1929, on 1928 income. Virginia has extended the privilege of deducting taxes paid from taxable income to all taxes, excepting income and inheritance taxes, and has added to the group of those who may claim a $2,000 exemption as head of a family all persons supporting parents, children other than minor children, or brothers or sisters. Massachusetts amended the personal income tax law to correct the situation created by the decision in the case of Sarah J. Parker *vs.* Com-

STATE PERSONAL INCOME TAX EXEMPTIONS AND RATES

State	Year When First Effective	Personal Exemptions			Rates of Tax (Per Cent)	Amount of Taxable Income in Excess of Which Maximum Rate Applies
		Single Person	Head of Family	Dependents		
Delaware	1917	$1,000	$2,000	....	1 —3	$10,000
Massachusetts	1917	2,000	2,500	$250[1]	1½—6[2]	.....
Mississippi	1914	1,000	2,000	200	1 —5	25,000
Missouri	1917	1,000	2,000	200	1	.....
New Hampshire	1924	200	200	....	0[3]	.....
New York	1919	1,500	3,500	400	1 —3	50,000
North Carolina	1921	1,000	2,000	200	1¼—5	15,000
North Dakota	1919	1,000	2,000	300	1 —6	10,000
Oklahoma	1913	3,000	4,000	200-500	2 —3¾	25,000
South Carolina	1922	1,500	2,500	400	1 —5	15,000
Virginia	1843	1,000	2,000	400	1½—3	5,000
Wisconsin	1911	0[4]	0[4]	0[4]	1 —6[5]	12,000

[1] Exemptions apply to earned income. There is a flat exemption of $300 on unearned income. [2] 1½% on earned income and annuities; 3% on capital gains; 6% on interest and dividends. [3] Average rate on real estate. For 1928 this was 2.8. Applies only to income from dividends and interest. [4] In place of exemption taxpayers may deduct from their tax after it has been computed, $8 for a single person, $17.50 for a head of family, and $3 for each dependent. [5] Including surtax for teachers' pensions rates are 1⅛%-7%.

missioner. The Parker decision made it impossible to tax stock dividends even when sold. The 1928 amendment will make it possible to tax such dividends.

The present status of state income taxes is as follows: Nine states, Massachusetts, Mississippi, Missouri, New York, North Carolina, North Dakota, South Carolina, Virginia and Wisconsin, are taxing both personal and corporation income. Three states, Delaware, New Hampshire and Oklahoma, are taxing personal income only. And, beginning in 1929, three states, California, Connecticut and Montana, will have taxes on corporation income only. All of these states except Delaware, Massachusetts, New Hampshire and North Dakota tax such income of non-residents as they can reach. New York, North Carolina and South Carolina, however, credit non-residents with the amount of any income tax paid in the state of residence if such state allows similar credits. All of these states but Mississippi, South Carolina and Wisconsin tax residents on income derived from sources outside of the state, with only Missouri and North Carolina allowing credits for income taxes paid in other states. (See table at bottom of page 203.)

DIGEST OF STATE CORPORATION INCOME TAX PROVISIONS

State	Year When First Effective	Kind of Corporations Exempt	Amount of Income Exempt	Rate of Tax (Per Cent)	Exemption of Dividends of Other Corporations Paying Income Tax to State	Exemption of Interest from Government Bonds
Connecticut	1915	Public utilities; insurance; banks.	$3,000 [1]	2	....	....
Massachusetts ..	1919	Public utilities; insurance.	.....	2½ [2]	X	....
Mississippi	1914	Banks.	1,000	1-5 [3]	X	X
Missouri	1917	Express; insurance; banks.	.....	1	....	X
Montana	1917	Express; national banks.	2,500	1	....	....
New York	1917	Public utilities; insurance; real estate.	.....	4½	....	....
North Carolina .	1921	Foreign insurance; national banks.	.....	4½	X	X
North Dakota ..	1919	Insurance; national banks.	.....	3	X	X
South Carolina ..	1922	Insurance; banks.	.....	4	X	X
Virginia	1927	Public utilities; insurance; banks.	.....	3	X	X
Wisconsin	1911	Public utilities; insurance.	.....	2-6 [4]	X	X

[1] Same as Federal. [2] Bank rate to be determined by Commissioner; not to exceed highest rate applied to business corporations. This was 5.34% in 1928. [3] Same as personal; maximum on taxable income in excess of $5,000. [4] Six per cent applies to all income in excess of $6,000.

REVENUE FROM STATE INCOME TAXES

In Delaware, the greater part of the proceeds of the income tax are credited to the state school fund. In Massachusetts, the state retains the temporary additional tax and enough of the regular tax to cover the cost of administration. The remainder is distributed to the local districts. In New Hampshire, also, the proceeds over the cost of administration are turned over to the towns and cities. In New York, half of the personal income tax, one-third of the corporation income tax and all of the bank income tax are distributed to the local districts. In Wisconsin, the surtax is used for special state expenditures, but only 40 per cent of the normal tax is kept by the state. In the other states the proceeds are all kept for state purposes. (See table above.)

TABLE OF REVENUE

(In thousands of dollars)

State	Amount from Personal Income	Amount from Corporation Income	Amount for State Purposes	Amount for Local Purposes
Connecticut [1]	.....	$ 2,623	$ 2,623	.....
Delaware [2]	$ 1,702	.....	1,702	.....
Massachusetts [3]	20,245	5,912	1,470	$24,687
Mississippi [4]	627	1,108	1,735	.....
Missouri [5]	2,102	1,627	3,729	.....
Montana [5]	.....	250	250	.....
New Hampshire [6]	620	.....	10	610
New York [1]	63,606	50,742	60,717	53,630
North Carolina [1]	2,354	5,842	8,196	.....
North Dakota [1]	234	286	520	.....
Oklahoma [1]	1,089	.....	1,089	.....
South Carolina [6]	343	1,419	1,762	.....
Virginia [7]	1,581	1,872	3,453	.....
Wisconsin [6]	6,793	13,337	8,261	10,097

[1] Collected for fiscal year ending June 30, 1928.
[2] Collected for fiscal year ending October 31, 1927.
[3] Collected for fiscal year ending November 30, 1927.
[4] Levied for fiscal year ending September 30, 1927.
[5] Levied for fiscal year ending June 30, 1928.
[6] Collected for fiscal year ending June 30, 1927.
[7] Personal and corporation income figures represent levies, and state and local figures represent collections for fiscal year ending June 30, 1927.

CORPORATION AND BANK TAXATION

By Jens P. Jensen

Professor, University of Kansas

CORPORATION TAXES

California.—Doubtless the most far-reaching changes made or pending in the taxation of corporations at present are to be found in California. Probably the final reports of the Special Tax Commission which is expected to appear early in 1929 will, as it was intended, suggest more extensive changes than have already been made. At a special session of the legislature a tax measured by 4% of the net income is levied upon business corporations, with an offset not exceeding 90% of the 4% tax for personal property taxes paid, and a minimum tax of $25 for each corporation. The corporation franchise tax is repealed. All business corporations are put on a parity with the banks. The measure was voted upon in November and passed, as is true of the 4% tax on banks and of the 3 mill tax on intangibles also provided.

Corporate Excess.—The Arkansas corporate excess tax was held unconstitutional (3 S. W. (2d) 340). It had been upheld (214 S. W. 43) as to domestic corporations on the theory that it was on the shares, whose situs was in the state of incorporation. It had been held invalid as to foreign corporations on the theory that the shares had no situs where the corporation merely did business. Now it was held invalid as to both because the state could not tax both. The Massachusetts Supreme Court held (Nov. 30, 1927) that lumber in transit (interstate) had no situs anywhere and was therefore not deductible as "merchandise and other tangible property situated in another state" or country, for the purpose of determining the corporate excess.

Allocation of Income or Business.—Where the corporate excise tax is measured by income, business, or property of a corporation doing an interstate business there is often difficulty in allocating the factors to the several taxing states. A Massachusetts corporation, having its head

office in the state and shipping lumber into or out of the state, was held by the state supreme court (Nov. 30, 1927) to be carrying on a local business and therefore being liable to the excise tax. But, though it had no office outside the state and there was no continuity in its outside business, it was nevertheless held to be doing business outside of the state, and therefore to be entitled to allocation.

A situation containing difficult problems was disclosed (155 N. E. 68) in New York. A foreign subsidiary selling corporation was owned by a foreign manufacturing corporation. The subsidiary was compelled to operate at a loss which was absorbed by the parent corporation. The tax commission required a consolidated report and assessed the franchise tax on the basis of the business of both corporations. The method was challenged, and the court held it appropriate only when both corporations were subject to the taxing jurisdiction—that is, were doing business in the state. In this way, however, the corporations can often situate their business at will, where there is no tax, or where it is light.

Capital Stock.—The New York license tax on foreign no-par-stock corporations was held invalid. It was 6 cents per share employed in state. The former tax of ⅛ of 1% of the capital employed in the state is now in force. The state courts in Utah and Washington have reached opposite conclusions as to whether the license tax based upon entire authorized capital stock is valid. In Utah, where the court held the tax was invalid, some further action may be expected.

Gross Receipts, Excise.—Massachusetts repealed the excise tax on street railways and electric railways, imposed at graduated rates on gross receipts. The rates ranged from 1% of gross receipts when the receipts were $4,000 per mile of track or less to 3% when the receipts exceeded $28,000 per mile.

BANK TAXES

Federal Legislation.—In bank taxation the movement to have Section 5219 R. S. U. S. amended so as to liberalize the restrictions now limiting the states in taxing national banks absorbs the interest to the exclusion of almost everything else. The loose organization formed in 1927 to sponsor the amendment was reorganized in 1928 and membership limited to state tax officials. The object is to have Section 5219 so amended that national banks may be taxed as the states desire, provided the national banks are not discriminated against as compared with the state banks. The American Bankers Association, the most representative organization of the banks, has vigorously opposed any change, voicing their fear that the states might tax unfairly both state and national banks. That relief may be had in the Federal courts under the Fourteenth Amendment does not, the bankers say, afford sufficient protection. Both sides were represented at the hearings before the House Committee on Banking and Currency of the Seventieth Congress on H. R. 8727 on May 10 and 11, 1928. But the bill was not reported favorably.

State Legislation.—In the meantime Virginia reduced the tax rate on bank shares from 11 mills to 10 mills on the dollar. New York repealed the tax of 5% on the amount of interest or compensation earned and collected on money loaned or employed in the state by unincorporated foreign bankers and investors, leaving them subject to the personal income tax. Minor amendments were also made in order to adjust the pro rata payments by new banks and trust companies and mergers or dissolutions.

The most important legislation was enacted in special session of the California legislature, following the preliminary report and recommendations of the special tax commission. A tax of 4%, "according to or measured by" net income, was imposed upon the banks, in lieu of all personal property taxes. The banks are thereby put on a parity with other business corporations, in respect to income taxation. California thus joins New York, Massachusetts, and Wisconsin in tax-

ing the banks on an income basis. The California income tax is expected to yield only about one-third of the yield of the capital stock tax on the banks, which it replaced. This change, like the other emergency tax changes of the special session, ran the gauntlet of the popular referendum in November.

Court Decisions.—But little in the way of court decisions affecting bank taxation developed. In a Kentucky case (284 S. W. 1089) it was held that mere personal investments, being taxed at 4 mills, did not constitute competing capital so as to compel taxation of bank shares at the same rate.

The U. S. Supreme Court (April 9, 1928) reversed the decision (252 Pac. 876) of the Montana state courts, holding the Montana tax on national banks invalid. National banks were taxed on their shares, properly enough, without deduction of United States securities. State banks, however, are taxed on their assets, necessarily with deduction of these securities, since they are exempt. To offset the discrimination in favor of the state banks, the corporate excess value was supposed to be taxed to the shareholders; but taxes of this sort are always very inadequately assessed. The Supreme Court held that, though the law technically did not contemplate the discrimination, discrimination did exist, in fact, sufficiently to invalidate the tax.

In a special assessment district a bank resisted the assessment against its real estate, alleging violation of Section 5219, because the assessment was made on the basis of the area and not according to the value of the real estate in the district. The Federal court, however, held [11 Fed. (2d) 936 (C. C. A.)] that so long as the bank was treated in the same way as other property in the district, no complaint would hold. Congress did not intend that the banks should demand preferential treatment in case of benefits accruing from public improvements enhancing the value of the land.

INHERITANCE TAX

By Mabel Newcomer

Professor, Vassar College

Federal Estate Tax.—Demand for the repeal of the Federal estate tax continued during the spring of 1928 while Congress was in session. The most active group urging the repeal of this tax was the Chamber of Commerce of the United States. Such action also received official support. In April, Secretary of the Treasury, Mellon again recommended the repeal of the estate tax, estimating the loss to the United States Treasury at a comparatively small sum. The repeal seems to have been favored also by the Republican members of the Senate Finance Committee, but the final recommendations of that Committee for tax reduction did not include any change in the estate tax. The Revenue Act of 1928 made no important change in either the estate or the gift tax.

State Taxation of Inheritances.—The rates of the Mississippi estate tax were revised materially by the 1928 legislature. The exemption for residents was increased from $10,000 to $100,000. And the initial rate was reduced from one per cent to four-fifths of one per cent. But at the other end of the scale the maximum rate was increased from ten per cent on net estates in excess of $1,000,000 to sixteen per cent on net estates in excess of $10,000,000. This will probably reduce the yield of the tax, since the increased exemption and the lower initial rates should outweigh the higher rates on large estates. It is only on estates in excess of $3,500,000 that the new rates are higher than the old. This act is to remain in force only as long as the Federal estate tax continues.

An attempt to substitute an estate tax for the present transfer tax was made in New York State. The bill passed both houses of the legislature but was vetoed by the governor.

The 1928 Virginia legislature revised the inheritance tax to exempt the intangible property of non-residents after January 1, 1929. Also, a number of changes were made in the law to facilitate administration.

Reciprocity Among the States.—Reciprocity among the states in the matter of taxing the intangible personalty of non-resident decedents made some progress in 1928. New York amended the transfer tax law to reëstablish the reciprocal provisions of the 1925 law and make them retroactive to July 1, 1925. The amended law does not violate the equal privileges and immunities clause in the United States Constitution which caused the earlier law to be held unconstitutional.

Mississippi, for the first time, joined the list of states which will impose no inheritance tax on the intangible personal property of decedents of states which have adopted similar reciprocal laws. The Mississippi law is effective as of April 23, 1928.

The reciprocal provisions will be effective in twenty-four states and the District of Columbia, beginning in 1929. Twelve of these twenty-four states have reciprocal provisions in their inheritance tax law. These are California, Connecticut, Illinois, Maine, Maryland, Massachusetts, Mississippi, New Hampshire, New York, Ohio, Oregon and Pennsylvania. Nine more states do not tax the intangible property of non-resident decedents, regardless of the tax provisions of the state of residence. These are Colorado, Delaware, Georgia, Massachusetts, New Jersey, Rhode Island, Tennessee, Vermont and Virginia. The Virginia provision applies first in 1929. Three states—Alabama, Florida and Nevada—and the District of Columbia have no inheritance taxes. Consequently the reciprocal provisions apply to residents of these states. These twenty-four states contain more than sixty per cent of the population of the United States.

AUTOMOBILE AND LICENSE TAXES

By Beulah Bailey

Librarian, New York State Department of Taxation and Finance

Revenue Receipts.—During 1927, the U. S. Bureau of public roads reported receipts from registration fees and operators' licenses in the U. S. amounting to $301,061,132, and from the gasoline tax $258,838,813. During 1926, the receipts from registration fees and operators' licenses were $288,282,352, and from gasoline taxes $187,603,231, making an increase in 1927 on the aggregate of $84,014,362. This is far from being the total automobile tax bill as 35 states had also a personal property tax on automobiles which in 1927 was estimated at $125,000,000. In addition, there was the Federal excise tax of 3% of the first sale price, now in 1928 repealed, which amounted to over $60,500,000 and the special municipal taxes estimated at $15,000,000. These figures exclude all the corporation taxes and real property taxes on the industry and the privilege taxes on stores, gasoline pumps, etc.

Expenditures.—Of the $559,899,945 from the registration fees and gasoline tax, $372,080,792 or 66% went for state highways, $109,018,054 or 19% for local roads, and $48,174,054 or 8% for state and county road bonds. Cost of administration of the registration fees was $14,876,410 or 4 7/10%. It is nearly impossible to figure the cost of administration of the gasoline tax as in so many states it is paid from other state funds.

Problem of Highways Levy.—There is still much discussion as to

whether the highways, like education, should be taken care of by general taxation levied upon society as a whole, or whether special taxation of the motor vehicle should pay for everything, or whether general taxation should pay for construction and special taxation for maintenance, or whether there should be an adjustment of general and special motor taxation so that there will be no unfair burden on the individual motorist.

The Gasoline Tax.—The various states are striving to arrive at a fair and equitable basis, favoring the last mentioned theory. The gasoline tax has been nearly every state's answer to a special tax. Today, New York and Illinois are the only states without a gasoline tax. Illinois levied one in 1927 but it was held unconstitutional in 1928. The rate of the state gasoline tax ranges in the various states from 2 cents to 5 cents per gallon.

In the early days of the gasoline tax, one of the chief arguments, against it was that states would start at a low rate of tax and then, as more money was needed, gradually increase the tax until it became excessive. This is what is happening. During 1928, Virginia raised its tax from 4½ cents per gallon to 5, and Kentucky made the temporary 5 cent tax permanent. There are now 6 states with a 5 cent tax, 12 with a 4, 1 with a 3½, 14 with a 3, and 13 with a 2. In January, 1927, the average tax rate on gasoline was 2.69 cents per gallon. In January, 1929, it will be 3.25 cents per gallon, making the tax about 16% of the cost of the article taxed.

Massachusetts' gasoline tax law has its unique features. In the first place, the privilege to be taxed is that of registration and not the privilege to use the roads; secondly, the sole purpose of the law is the spreading with greater equality and fairness the automobile owner's contribution towards the construction and upkeep of the highways rather than the increasing of the revenue, as registration fees on gasoline driven motor vehicles will be reduced by about 70%; thirdly, the system of refunds or lack of refunds. The tax is payable by the distributor who must be licensed. The tax is only on gasoline used on the highway. Importers, users or sellers of gasoline for purposes not taxable will, on approval of an application accompanied by a blue print or sketch of the station, and the filing of a surety company bond in the maximum sum of $2,000, become distributors, and will pay no tax. Of course, if any of the fuel should be sold for highway purposes, a tax would be payable then. If this innovation works, it will reduce the administrative problems attendant upon refunds.

Motor Registration Tax.—Massachusetts is trying an innovation in the form of an excise on registered motor vehicles in lieu of the local general property tax. The excise is laid on the privilege of operating motor vehicles on the highway. The value at which the motor vehicle will be assessed will be the same in each city and town in the state. The local assessors will assess the excise and the local collectors will collect it. The valuations are according to a table which is for the first year 90% of manufacturers' list price, second year 60%, third year 40%, fourth year 25% and fifth and succeeding years 10%. The assessor has the right of abatement, if he thinks this excessive. The rate is the "state rate," the same as used for public utilities. The proceeds from the tax will be retained by the cities and towns for the general treasury. The valuation of the motor vehicles is to be considered in determining the borrowing capacity of each city and town. The tax is laid at the home address of the owner as determined by the owner's state registration. The same car will pay but one excise tax during the year. There is no excise tax for registration. This tax becomes effective January 1, 1929, as does also a 2 cent tax on gasoline.

Registration Rates.—The only other state to make any noticeable changes this year in its registration rates was Mississippi. Mississippi made a small change in the rates for motor

trucks. Formerly, the rate for hard tires ranged from $15 to $600, and for pneumatic tires from $10 to $400. Now it is from $10 to $600 for the former, and from $7.50 to $400 for the latter. The schedule on trailers has been increased from $10 to $50, up to $15 to $80. The county tax on omnibusses was reduced from $4.00 for each passenger carrying capacity to $2.00. The county tax on gasoline was formerly limited to 2 cents in addition to the state levy. It is now 3 cents. The only counties in Mississippi that can levy this special gasoline tax are those which issue bonds for the maintenance of sea walls for the protection of the roads.

COGNATE SOCIETIES

BANKING AND CURRENCY

AMERICAN BANKERS ASSOCIATION.—110 E. 42nd St., New York, N. Y.

AMERICAN INSTITUTE OF BANKING.—110 E. 42nd St., New York, N. Y.

INVESTMENT BANKERS ASSOCIATION OF AMERICA.—531 First Nat'l Bldg., 33 So. Clark St., Chicago, Ill.

INVESTORS' VIGILANCE COMMITTEE, INC.—42 Broadway, New York, N. Y.

NATIONAL ASSOCIATION OF MUTUAL SAVINGS BANKS.—11 E. 36th St., New York, N. Y.

NEW YORK CLEARING HOUSE ASSOCIATION.—77 Cedar St., New York, N. Y.

PRIVATE BANKERS' ASSOCIATION.—31 Nassau St., New York, N. Y.

UNITED STATES LEAGUE OF BUILDING AND LOAN ASSOCIATIONS.—22 E. 12th St., Cincinnati, O.

INSURANCE

ACTUARIAL SOCIETY OF AMERICA.—256 Broadway, New York, N. Y.

AMERICAN INSTITUTE OF ACTUARIES.—720 No. Michigan Ave., Chicago, Ill.

AMERICAN INSTITUTE OF MARINE UNDERWRITERS.—56 Beaver St., New York, N. Y.

AMERICAN LIFE CONVENTION.—Omaha, Nebraska.

AMERICAN MARINE INSURANCE SYNDICATE.—56 Beaver St., New York, N. Y.

ASSOCIATION OF CASUALTY & SURETY EXECUTIVES.—Globe Indemnity Co., Newark, N. J.

ASSOCIATION OF LIFE INSURANCE PRESIDENTS.—165 Broadway, New York, N. Y.

BOARD OF UNDERWRITERS OF NEW YORK.—56 Beaver St., New York, N. Y.

CASUALTY ACTUARIAL SOCIETY.—75 Fulton St., New York, N. Y.

NATIONAL AIRCRAFT UNDERWRITERS' ASSOCIATION.—1 Park Ave., New York, N. Y.

NATIONAL ASSOCIATION OF LIFE UNDERWRITERS.—11 W. 42nd St., New York, N. Y.

NATIONAL ASSOCIATION OF MUTUAL CASUALTY COMPANIES.—730 Fifth Ave., New York, N. Y.

NATIONAL ASSOCIATION OF TRAVELERS' AID SOCIETIES.—23 W. 43rd St., New York, N. Y.

NATIONAL BOARD OF FIRE UNDERWRITERS.—85 John St., New York, N. Y.

NATIONAL BUREAU OF CASUALTY & SURETY UNDERWRITERS.—1 Park Ave., New York, N. Y.

NATIONAL COUNCIL ON COMPENSATION INSURANCE.—151 Fifth Ave., New York, N. Y.

NATIONAL COUNCIL ON WORKMEN'S COMPENSATION INSURANCE. — 80 Maiden Lane, New York, N. Y.

NATIONAL FIRE PROTECTION ASSOCIATION.—Boston, Mass.

SURETY ASSOCIATION OF AMERICA.—160 Broadway, New York, N. Y.

DIVISION VIII

PUBLIC RESOURCES AND UTILITIES

FEDERAL SURVEYS AND MAPS

By Joseph Henry Wheat

Secretary, Federal Board of Surveys and Maps

FEDERAL BOARD OF SURVEYS AND MAPS

The Board of Surveys and Maps of the Federal Government is comprised of the following government services: Corps of Engineers, War Department; U. S. Coast and Geodetic Survey, Department of Commerce; U. S. Geological Survey, Department of the Interior; General Land Office, Department of the Interior; Division of Topography, Post Office Department; Bureau of Chemistry and Soils, Department of Agriculture; Bureau of Reclamation, Department of the Interior; Bureau of Public Roads, Department of Agriculture; Office of Indian Affairs, Department of the Interior; Mississippi River Commission, War Department; U. S. Lake Survey, War Department; International (Canada) Boundary Commission, State Department; Forest Service, Department of Agriculture; U. S. Hydrographic Office, Navy Department; Military Intelligence Division, General Staff, War Department; Federal Power Commission; Air Corps, War Department; Bureau of Aeronautics, Navy Department; Aeronautics Branch, Department of Commerce; Bureau of Foreign and Domestic Commerce, Department of Commerce; Geographic Section, State Department; Division of Maps, Library of Congress.

THE GEOLOGICAL SURVEY

Scope of Activities.—The Geological Survey is the most productive of the mapping organizations of the Federal Government. It publishes maps in the greatest volume and the greatest variety, although its activities are by no means confined to surveying and map-making. It is engaged in making a geologic map of the United States and Alaska, involving both topographic and geologic surveys; in conducting investigaitons relating to surface and underground waters; in classifying the public lands and supervising the engineering phases of mineral leasing. In some of these activities, the resulting maps are incidental, being required as illustrations for scientific or engineering reports. Even in purely engineering mapping, however, the Geological Survey may be said to be the foremost governmental agency, as it is engaged in making the basic topographic map of the entire area of the United States.

Topographic Mapping.—In taking advantage of new methods and new instruments for expediting the mapping program, the Geological Survey has made extensive use of aerial photographs in topographic mapping, through coöperation with the Army Air Corps and tme Bureau of Aeronautics of the navy. These services have furnished the Geological Survey with aerial photographs for use in the compilation of base maps on the standard topographic map scale. The Geological Survey has been conducting a series of tests with a mechanical stereoscopic device for use in constructing topographic maps from aerial photographs, known as the Hugershoff aerocartograph. The tests conducted have demonstrated the efficiency and practicability of the in-

strument, and the Geological Survey plans to use it with photographs taken of areas where surveys by ordinary ground methods would be very difficult.

THE COAST AND GEODETIC SURVEY

The Coast and Geodetic Survey is one of the oldest surveying bureaus of the government. It is charged with the survey of the coasts of the United States and its possessions and with the publication of navigational charts of those regions. These surveys include base measurements, triangulation and traverse, hydrography and topography, tidal and current observations along those coasts; deep-sea soundings, temperature and current observations along the course of the Gulf and Japan streams; the survey of rivers to the head of tidewater; magnetical observations and researches; seismological investigations; gravity measurements; and the determination of elevations by trigonometrical leveling. The Coast and Geodetic Survey is also charged with the determination of geographical positions by astronomical observations and by triangulation and traverse, and with the determination of elevations by spirit leveling, in the interior of the United States and Alaska. One of the newer activities of the Coast and Geodetic Survey is the compilation of maps of airways for civil aerial navigation. These are published in the form of strip maps for the Aeronautics Branch, Department of Commerce.

GENERAL LAND OFFICE

The General Land Office is the oldest surveying and mapping bureau of the government. The act of Congress approved May 18, 1796, provided for the appointment of a Surveyor General and directed the survey of the lands northwest of the Ohio River. A subsequent act of Congress approved April 25, 1812, provided for the establishment of a General Land Office under the direction of a commissioner. This Bureau makes rectangular surveys of the public lands, including resurveys when necessary. These are published in the form of township plats. The Bureau issues annually a wall map of the United States showing the extent of the public surveys, national parks, national monuments, national forests, Indian, military, bird, and game reservations, and other useful information. It also issues maps of the 29 public-land states, Alaska, and Hawaii.

OTHER GOVERNMENT SERVICES

The Hydrographic Office is charged with topographic and hydrographic surveys in foreign waters and on the high seas; the collection and dissemination of hydrographic and navigational information; the preparation and printing of maps and charts relating to and required in navigation; the preparation and issue of sailing directions; light lists, pilot charts, navigational manuals, periodicals, and radio broadcasts for the use of all vessels of the United States and for the benefit and use of navigators generally. It maintains intimate relations with the hydrographic offices of all foreign countries and with the International Hydrographic Bureau, Monaco. A new activity of the Hydrographic Office is the compilation and publication of aviation charts.

The Corps of Engineers makes special topographic maps of areas of military importance and has made topographic maps of a few quadrangles not surveyed by the Geological Survey, besides revising some of the older topographic maps of the Geological Survey. Airway strip maps for the Air Corps are compiled and printed by the Corps of Engineers.

The Mississippi River Commission has published a series of maps showing the profile of the river and the topography along the shores, extending from the source to the mouth of the river.

The International (Canada) Boundary Commission has published a series of topographic maps extending approximately 1 mile on each side of the United States-Canada boundary line and along the east boundary of Alaska.

The Post Office Department, Topography Branch, compiles post-route maps for all the states, Alaska, Ha-

waii, the Samoan Islands, Guam, Canal Zone (Panama), Porto Rico, and the Virgin Islands. It also compiles rural free delivery maps of many of the counties in each of the states.

The Bureau of Chemistry and Soils publishes maps which show the character of the soils in the area covered. A single soil map will usually cover the area of a county.

The Bureau of Public Roads publishes maps of the United States showing the Federal aid system of highways and also maps of some of the states carrying more detailed information of the same character.

TRIANGULATION AND LEVELING

Horizontal and vertical control are necessary to insure accuracy in a map, and all such control should be based on triangulation and leveling. The plan for the standard topographic mapping of the United States calls for a complete network of triangulation based on the standard (North) American datum. This datum is the geographic position of Meade's Ranch, Nebraska, and it is the accepted datum for the North American continent, as the United States, Canada, and Mexico have adopted it and have made their position adjustments to conform to it. All elevations are based on mean sea level. The existing first and second order triangulation and leveling have generally been executed by the Coast and Geodetic Survey, but the Lake Survey has executed first order triangulation along the shores of the Great Lakes with other connecting lines, and triangulation and leveling of the third order in the interior of the country have been done by the Geological Survey and the Corps of Engineers, which has extended triangulation and leveling along portions of the Ohio, Tennessee, Missouri, and Sacramento Rivers and in some other localities.

The Mississippi River Commission has established many third order triangulation stations and level bench marks along the Mississippi River. The International (Canada) Boundary Commission has established numerous first order triangulation stations to fix the boundary between the United States and Canada. Thousands of miles of triangulation and leveling will be required to complete the topographic mapping of the United States, and eventually there will be an elevation in geographic position of the first or second order established within about 25 miles of every point in the United States. Areas between these arcs and lines of the first and second order control will be covered by the third order control. Thus the engineer should eventually have a triangulation station and a reliable level bench mark properly monumented within about 10 or 15 miles of every point in the United States.

AIR NAVIGATION MAPS

The Department of Commerce, under the Air Commerce Act, is now charged with the compilation and reproduction of maps of the civil airways. The work is being done by the Coast and Geodetic Survey, one of the bureaus of the department. The program undertakes the publication of airway "strip" maps in form generally similar to those of the Army Air Corps. The Commerce and Air Corps maps cover airways from place to place in strip form. The width of the area covered is about 80 miles. Aviation charts compiled and published by the Hydrographic Office are constructed on the Mercator projection and cover a much larger territory than the strip maps. Air navigation maps are distributed by the Aeronautics Branch, Department of Commerce.

AERIAL PHOTOGRAPHY IN MAPPING

Aerial photographs are of special value as an aid to the production of the standard topographic maps made by the Geological Survey and as an aid in making large scale topographic maps of cities, harbors, rivers, and highly developed sections of the country. The Coast and Geodetic Survey has made use of them in charting the coast lines and stretches of coastal country, tedious and difficult to survey by ground methods. The air services of the army and

navy have been supplying aerial photographs for the government bureaus for use in mapping. The Geological Survey, the Corps of Engineers, the Hydrographic Office, the Coast and Geodetic Survey, and the Forest Service are chiefly interested in the developments in this field and are making use of aerial photographs on map work.

As a result of the application of aerial photographs to map and chart production, a high degree of accuracy has been obtained in detail, particularly in that pertaining to the meanders of drainage, the shore lines of the coasts and of lakes and ponds, and the boundaries of swamp and wooded areas. In practically all map work where aerial photography has been employed, improvement in the quality of the maps has resulted. In some areas, aerial photography has reduced the cost of mapping and has considerably lessened the time required for field work. The greatest reduction in cost has come in the work of revising maps. On some maps nearly the entire work of revision has been accomplished by means of aerial photographs.

THE YEAR'S SURVEYS

Geological Survey.—Topographic mapping by the Geological Survey in the United States and Hawaii in 1928 amounted to 17,721 square miles. Of this total, 13,777 square miles represents new surveys, 2,417 square miles resurveys, and 1,537 square miles revisions. In connection with the topographic work, 6,272 miles of spirit levels, and 4,046 miles of transit traverses were run, and 157 triangulation stations were occupied.

The Coast and Geodetic Survey covered an area of 8,100 square miles with first order triangulation, 2,130 square miles of second order triangulation, and ran 23 miles of first order traverse, 2,135 miles of first order leveling, and 88 miles of second order leveling. Hydrographic surveys aggregating 41,387 square miles and 811 square miles of topographic mapping were completed. Six maps of civil air routes were published.

The Bureau of Chemistry and Soils completed 21,838 square miles of soil surveys during the past year.

The General Land Office made original surveys and resurveys aggregating 3,000,000 acres, and the revision of the wall map of the United States and the state maps of California and Minnesota.

The Forest Service completed 912 square miles of topographic surveys and 2,294 square miles of drainage surveys. In connection with mapping, 69 second and third order triangulation stations were occupied, and 120 miles of second and third order leveling were run.

Hydrographic Office.—Surveying operations under the direction of the Hydrographic Office during 1928 included work on the north and south coasts of Cuba, in the Gulf of Panama, and special surveys of Corinto Harbor, Nicaragua, and Port La Union, Salvador. Aerial photography was used extensively by all parties for topographic details as well as for reconnaissance. The total area covered by the season's surveys is approximately 3,660 square miles.

Corps of Engineers.—Topographic mapping by the Corps of Engineers included 1,258 square miles in continental United States and 444 square miles in the Panama Canal Zone.

STATE GEOLOGICAL SURVEYS

By M. M. Leighton

Chief, Illinois Geological Survey

GENERAL

State Appropriations.—Because of the great mineral wealth of this country and because an intelligent exploration, recovery, and conservation of the mineral resources requires technical information which can be supplied only by government agencies,

thirty-six states maintain geological surveys. In 1928, appropriations to these surveys amounted to $1,300,000 approximately, an average of over $36,000 for each state's scientific services. This was further increased by about $265,000 from coöperating Federal agencies, counties, and local organizations. A few states were embarrassed by diminished appropriations or temporary denials. About 102 full-time, technically trained men and 225 part-time men participated in this effort.

Administrative Changes.—Only a few changes occurred in administration. Two additional surveys, Ohio and Virginia, have been separated from their state universities because of an increasing load of duties of the surveys incompatible with teaching schedules. Wilbur Stout of Ohio State University has been named to succeed Dr. J. A. Bownocker, deceased. Virginia's successor to Wilbur A. Nelson, resigned, has not been announced. In Montana, Dr. Francis A. Thomson, the new president of the Montana School of Mines, is the new ex-officio director of the State Bureau of Mines and Metallurgy, and in Alabama, Dr. Walter B. Jones has been named to succeed Dr. E. A. Smith, deceased.

FUNDAMENTAL STUDIES

Arizona carried on paleontological studies bearing upon the age and correlation of certain sedimentary formations in the northern section. Arkansas prepared a geologic map of the State, issued a pamphlet, *An Outline of the Physical Features of Arkansas*, and is publishing reports on the upper cretaceous formations of southwestern Arkansas and on the St. Peter and related sandstones of northern Arkansas. Georgia studied the stratigraphy and economic geography of the Tate quadrangle. Indiana published a report on the silurian formations of northern Indiana. Idaho made a survey of the Clark Fork area, and published a report on a geological reconnaisance of the Ste. Marie's region.

Illinois made a preliminary examination of the heavy minerals of the Chester sandstones of the Mississippian system and studied over 2000 samples of well cuttings from 28 wells distributed over the State. Field work was completed on the Elgin, Havana, Roodhouse, and Winchester quadrangles, carried to an advanced stage in the Brighton, Glasford, Hardin and Brussels quadrangles, and a report on the geology and mineral resources of the Herscher quadrangles was published, together with Educational Series No. 2 on *The Rock River Country of Northwestern Illinois.*

Iowa issued a report regarding deep wells of the state, well water recessions, map showing contours of St. Peter sandstones, and the Maquoketa formation. Kansas studied the paleontology of Kansas and adjoining states with special reference to micro-fauna. Kentucky completed the field work and manuscript writing of the report on the geology of Henderson County, the Smithland quadrangle and the economic geography of the Mississippian plateau in Kentucky; the field work for a report on the sedimentary origin of Kentucky, and geological maps for Bourbon, Harrison, Lincoln, Montgomery, McCreary, Estill, Bell, Harlan, northern Hardin, and Crittenden counties. The following reports were published: *Pleistocene of Northern Kentucky, Geology of the Dawson Springs Quadrangle, Geography and Physiography of the Mammoth Cave National Park,* and *Ancient Life in Kentucky.* A geological map and also a topographical map of the State were issued.

Michigan made detailed surface or glacial and hard rock geological surveys of Chippewa and Alger counties and studied and correlated about 200 well records involving 15,000 well samples. Minnesota published a geological map of the State. Mississippi carried on stratigraphic studies on the Eocene and Cretaceous formations, emphasizing the micropaleontology, and completed manuscripts on the Paleozoic formations of the State and on the economic geography of Mississippi. Montana completed the field work for a geological blue book of the Yellowstone Trail in Montana.

New Mexico published a geological map of the Magadelena district, So-

corro County, and a bulletin on the State's mining laws. New York completed field work on the geology of the Albany, Troy, Schenectady, and Cohoes quadrangles, and carried on work in the Oswegatchie, Randolph, and Cattaraugus quadrangles. Paleontological studies were made of graptolites and of Devonian plants and faunal facies. North Carolina published an Educational Bulletin on *The Story of the Geologic Making of North Carolina.* Ohio studied the stratigraphy of Holmes County, and published bulletins on *The Geology of Benton County,* and *The Fauna of the Silica Shale.*

Oklahoma, in coöperation with the State University and the U. S. National Museum, carried on studies of the stratigraphy of the Arbuckle limestones and Simpson formations in the Arbuckle and Ouachita mountains; of the joint planes and fractures of those mountains according to the Hans Cloos method to determine, if possible, the relative age of the folding of the two mountain uplifts; sedimentation studies in the Anadarko basin; and a field study of the various dolomite beds in the Permian red beds of western Oklahoma. Oklahoma is also coöperating with the National Research Council, the American Petroleum Institute, and the U. S. Geological Survey in a study of the deep well temperatures of the State. Reports were also issued on the carboniferous rocks of the Ouachita mountains, the boulders in the Caney shale, and the physical characteristics of the Arbuckle limestone.

Pennsylvania completed detailed studies of the geology of the Lancaster and Middleton quadrangles, carried on similar studies in the Bradford, Curwensville, Houtzdale, Freeport, Tyrone and York quadrangles, completed reports for Adams and Greene counties, published topographic and geologic survey atlases of the Pittsburgh and New Castle quadrangles and in coöperation with the U. S. Geological Survey studied the glacial geology of Pennsylvania outside of the Wisconsin terminal moraine and also investigated the recent terraces of southeastern Pennsylvania. Tennessee studied the geology and geography of the Glade areas of middle Tennessee and published a relief map of the State. Texas issued reports on the geology of Tom Green County, a handbook of Texas cretaceous fossils, and contributions to geology.

Virginia completed the reconnaissance of the metamorphic and crystalline rock area lying east of the Blue Ridge, carried on mapping of the tertiary deposits of the Coastal Plain, completed the field work on the pegmatites of the State, and published a new state geologic map. Washington carried on detailed stratigraphic and structural work in Stevens County.

West Virginia completed its stratigraphic and paleontologic study of the Silurian, Devonian, Mississippian, and Pennsylvanian systems of Pocahontas and Randolph counties and is now preparing reports. In coöperation with the U. S. Geological Survey, a systematic study is being made of the paleo-botany of the Devonian fossil trees of Randolph County. Detailed reports have been published on Hampshire and Hardy counties and also on Pendleton County. Wisconsin has issued part II of *The Fresh Water Mollusca of Wisconsin,* and has in press part I.

STUDIES IN OIL AND COAL

Oil and Gas.—**Arkansas** prepared reports on oil and gas possibilities of southern and eastern Arkansas and on the gas possibilities of the Arkansas River Valley; issued a pamphlet on *An Outline of the Petroleum and Natural Gas Resources of Arkansas,* published an oil- and gas-well map showing the location, depth, and other data on all wildcat wells in the State of which there are official records. Idaho published on *Coal and Oil Possibilities in Clark County* and *Oil Possibilities of Melon Valley near Buhl, Idaho.* Illinois completed its studies of the Media area in Henderson County, northwest of St. Francisville, Lawrence County, and the Ayers Anticline in Bond County, and published reports on *The Oil and Gas Development and Possibilities in Southeastern Illinois,* on the Ava-

Campbell Hill area, on corrosion in the eastern Illinois oil fields, on the Media area, and on the Ayers anticline. A preliminary study was also made of the Kell area in Marion County, of the Siggins polo for mining data, and of the oil field clays and shales which might be utilized for mudding.

Kansas prepared a bulletin on the oil and gas resources of Cowley County and a circular on oil and gas development in the State during 1927. Kentucky completed a report on the geology of petroleum and natural gas in the western Kentucky coal field, issued an oil and gas map of Warren and Christian counties, and structural maps of Bell, Harlan, Elliot, Floyd, and northern Hardin counties. Michigan completed contour and structure maps of the Saginaw and Muskegon oil fields and of the geologic structure of southeastern and southwestern Michigan, and inspected the plugging of all dry holes. Mississippi investigated oil and gas structures and published a bulletin on the recent oil and gas prospecting in Mississippi. Montana completed the report on the Kevin sunburst oil and gas field and the area adjacent. New York has a report in preparation on the oil and gas fields in the western part of the State. Ohio has been collecting additional subsurface data on its oil and gas territory for its survey's files. Oklahoma has published part of its bulletin on *Oil and Gas in Oklahoma* and another bulletin on *Oil Sands and Production Relations.*

Tennessee has carried on studies in regard to the structure and oil and gas possibilities of Lincoln County, issued a pamphlet on the oil and gas possibilities of Tennessee and published a structural map of eastern Clay County. Washington carried on field studies in the western part of the State in regard to oil and gas possibilities. West Virginia carried on correlation studies which fairly well established the existence of new producing gas horizons in the deep upper and middle Devonian shales of the southern counties, thus adding a vast but undetermined gas reserve to the State.

COAL

Idaho published a report on the coal and oil possibilities in Clark County and another on coal prospects in Willow and Fall Creeks, Bonneville County. Illinois completed its work on coal stripping possibilities in southern and southwestern Illinois. Indiana issued, in coöperation with the U. S. Bureau of Mines, a report on the coals of Indiana. Kentucky completed its field work and report on cannel coals and also on the geology of the western Kentucky coal fields. It also completed the publication of the series of 10-foot contoured structural maps of the eastern Kentucky coal field. Michigan completed its work of sampling coal mines in coöperation with the U. S. Bureau of Mines, and its survey study of peat deposits of three counties.

Ohio sampled and analyzed 26 coals from various parts of the State the results of which will be incorporated in an early bulletin. Oklahoma, in coöperation with the U. S. Geological Survey, mapped the outcrops of certain beds of coal in Haskell and Muskogee counties, and sampled the coal beds in the eastern part of the State at 87 mines, to determine the heating value of the coal. Pennsylvania published part I of its general bulletin on the bituminous coal fields of Pennsylvania, *General Information on Coal;* part III on *Coal Resources,* and a reprint of part IV on *Coal Analyses.* A report was also published on anthracite culm and silt. West Virginia has definitely proved the existence of high grade New River coal in a vast area of cut-over land hitherto regarded as worthless. This territory contains approximately 500,000,000 net tons of coal. It has also published a report on *The Cheat Mountain Coal Field of Randolph County.*

ORE DEPOSITS

Arizona has published bulletins on *Arizona Gold Placers* and *The Mineral Industries of Arizona.* Reports have been completed on asbestos and on the geology and ore deposits of the Jerome quadrangle. Arkansas has

published a pamphlet entitled *An Outline of the Metallic Minerals of Arkansas.* California has made a survey of all mineral resources of certain counties. Idaho has made a study of the ore deposits of the Lava Creek area, a brief examination of certain mineral prospects in the St. Joe area and published reports on the geology and ore deposits of the Rocky Bar quadrangle and the Birch Creek district. Michigan made a detailed magnetic-geological survey on the Keweenaw copper-bearing series in Houghton and Keweenaw counties, a magnetic-geological survey of Iron County, and prepared for publication a bulletin on the mineral resources of Michigan. It also made its annual appraisal of the iron and copper mines for the State's Tax Department.

New Mexico began an investigation of the geology and ore deposits of the Magdelena district, Socorro County and published a bulletin on *Fluorspar in New Mexico.* The manuscript and maps for a bulletin on *Mica and Lithium Minerals in New Mexico* were lost in the fire which destroyed the bureau's offices last July. North Carolina published a bulletin on the *Pyrophllite Deposits of North Carolina.* In addition, two new feldspar grinding plants, and three mica grinding plants were located through the efforts of the Division of Mineral Resources. Oklahoma completed the study on the lead and zinc deposits of northeastern Oklahoma.

Virginia, in coöperation with the U. S. Geological Survey, has completed the field work and a preliminary report on *The Future of the Iron Ore Industry in Virginia.* Wisconsin made the valuations of its various mines for the State Tax Commission. Wyoming published a report on *Economic Minerals of the State of Wyoming.*

NON-METALLIC AND STRUCTURAL MATERIALS

Arkansas prepared a report on the St. Peter and related sandstones of northern Arkansas. California published a bulletin on the clay resources of the State and reports on certain other counties. Florida reported upon the sand and gravel deposits of the State, and its beach deposits, and is now investigating its clays. Georgia made a study of its clay deposits. Idaho published a report on Portland cement materials. Illinois studied the fuller's earth deposits of Pulaski County, the clays and shales of southern Illinois, the economic mineral resources of Pope, Hardin, Johnson, and Massac Counties, the limestone resources of Pontiac area, and published a bulletin on the *Geology and Mineral Resources of the St. Peter Sandstone of Illinois.* Indiana studied the building stone materials of the State and published 2 maps on the building stone belt.

Iowa prepared a report on molding sands and Kansas a report on its volcanic ash resources. Michigan mapped and tested the marl deposits of three counties, made road material surveys on all state trunk lines to be built and completed the preparation of a monograph on the molding sands of the State. Minnesota prepared reports on the marl deposits of the western part of the State and on the Rove slate area of northeastern Minnesota. Mississippi investigated its pottery and ball clay deposits, bentonite, bauzite, and fuller's earth, and published a preliminary report on bentonite. Missouri made a study of the east-central clay district. New York published a bulletin on the *Geology and Origin of the Silurian Salts of New York State.* North Carolina studied its ceramic materials and published reports on pyrophyllite deposits, and the mineral industry of the State. Ohio published a new mineral industries map of the State showing the ceramic plants, coal, oil and gas, and other mineral industries and issued a directory of producing firms to accompany it.

Oklahoma completed its study and published a bulletin of the road building materials of southwestern Oklahoma; collected samples of clays and tested them in the University ceramics laboratory. About 100 samples of asphalt from southern Oklahoma were collected for tests to determine the best methods of utilizing

these deposits. Pennsylvania completed the study and report on building stones, and studied the sand and gravel deposits including the roofing granuels. Pennsylvania published bulletins on its fire clays and on molding sand. Tennessee studied sand and gravel deposits in the northeastern part of the State and the slates of eastern Tennessee. Virginia completed field work on the soapstone deposits. Vermont studied the clay deposits of the Bennington area. Wisconsin is publishing a report on molding sands. Wyoming published a report on the economic minerals of the State.

WATER RESOURCES

Arkansas has established stream gauging stations for a study of its water resources and has undertaken a survey of underground water resources of the Rice district of eastern Arkansas. Florida is making detailed studies of samples from deep wells. Idaho studied the underground water resources in the vicinity of Orofino and of Lapwai, published a brief report on the possibilities of an underground water supply for the city of Weiser, and published a report on the subsurface water supply in Big Lost River valley. Illinois gave advice and information to 38 towns on sources of water supplies, and to four towns on sources of contamination. Iowa's new volume will contain papers on "Deep Wells of Iowa" and "Well Water Recessions." Michigan collected about 200 well records and 15,000 well samples which have been studied and correlated. Minnesota published a report on the water supply of the western part of the State. Mississippi collaborated with the U. S. Geological Survey in publishing a report on the *Underground Water Resources of the State.*

Oklahoma in coöperation with the American Petroleum Institute and the National Research Council is studying the geo-thermal gradient of its deep wells. Virginia, in coöperation with the U. S. Geological Survey, is engaged in mapping the larger springs of the valley of Virginia, and in studying their relations to the geology of the region, the origin of the waters of various temperatures, their changes in flow, temperature and chemical composition throughout the year, and of their economic value. During the past year the water resources and power division of the State Geological Survey was made an independent division. Before this separation, the State Geological Survey published a large bulletin on *The Water Resources of the State.* West Virginia has continued its gaging of all principal streams in coöperation with the U. S. Geological Survey.

RECLAMATION AND IRRIGATION

By Hugh A. Brown

Assistant Director of Reclamation Economics, Department of the Interior

IRRIGATION REPAYMENTS

Settlers on the 24 operating Federal irrigation projects located in 15 of the 17 arid and semi-arid states of the West made larger repayments of the charges against their lands during the fiscal year 1928 than ever before in the history of Federal reclamation. These water users paid into the Treasury on this account $4,260,000 during the previous year and $5,299,000 in 1928, a gain of nearly 25 per cent.

This marked increase in repayments may be attributed to two main causes. Foremost is the general prosperity on the reclamation projects as a result of which money for repayments is available. Only less important is the general readjustment of financial relations between the Government and the project settlers. New contracts have been entered into with the water users associations and irrigation districts, establishing new paying bases for repayment which

make satisfactory returns to the association possible.

RECLAMATION FUND

The Bureau of Reclamation has a revolving fund of about $166,000,000 invested in the Federal irrigation projects. Under the Reclamation Act of June 17, 1902, and acts amendatory thereof and supplementary thereto, the money so invested ultimately will be returned to the reclamation fund by those who are benefited by the Government's reclamation work. When it is returned it is then available for use in developing new projects. Money received by the Government from the sale of public lands, amounting at present to about $500,000 a year, is placed to the credit of the fund. Money received as royalties from oil leases totaling about $4,000,000 a year is credited to this fund. The fund also benefits by the construction repayments by the water users. The combined revenues received from all sources for investment in the development of reclamation projects for the fiscal year beginning July 1, 1928, amounts to about $15,000,000.

The financial status of 22 of the 24 operating projects is such that they are now making regular repayments to the Government, under their contracts, of the money advanced to them for construction. The two remaining projects have entered into contracts with the Government under which they will begin repayments in 1930 and 1932.

APPROPRIATION ACT

The Appropriation Act of March 7, 1928, for the fiscal year 1929, made available $15,024,000 for reclamation, distributed as follows: Examination and surveys, $183,000; storage system, $6,236,000; pumping system, $25,000; canal system, $3,699,450; lateral system, $750,550; drainage system, $999,500; power system, $1,240,000; irrigable lands, $23,000; telephone system, $7,000; operation and maintenance, $1,660,500; and miscellaneous, $200,000.

Among the larger and more important items mentioned in the act were $1,000,000 for the canal system of the Gravity Extension Unit of the Minidoka project, Idaho; $1,240,000 for the development of the power system at American Falls dam on the Snake River, Idaho; $1,130,000 for continuing the construction of Gibson dam, Sun River project, Montana; $1,990,000 for the commencement of construction of the Owyhee dam, Owyhee project, Oregon-Idaho; $750,000 for the continuation of construction of the Vale project, Oregon; $1,490,000 for continuing the construction of the Echo dam, Salt Lake Basin project, Utah; $1,800,000 for construction of the canal and lateral system of the Kittitas division of the Yakima project, Washington; and $537,000 for the development of the Pilot division of the Riverton project, Wyoming. The act also carries an appropriation of $75,000 for settlement and economic activities, including examination of soils and the classification of land; and $15,000 to continue the investigations being made by the Bureau of Reclamation of opportunities for planned group settlement in the South.

INCOME AND EXPENDITURES

The total income of the Bureau of Reclamation during the fiscal year 1928 was $9,303,330.25, or $377,388.84 less than during the previous year. The operation expense for the year was $1,762,952.67, a decrease compared with the previous year of $52,414.88. The payments received from the water users for operation and maintenance were $1,843,384.86, or $214,299.40 greater than in the previous year. Excess of operation and maintenance receipts over expense for the period amounted to $80,432.19 compared with a deficit of $186,382.09 for the previous year. The amount appropriated for construction was $9,869,000 compared with $4,443,000 the previous year, both figures exclusive of reappropriations. The amount expended on construction was $6,966,449.25 compared with $5,189,025.93 the previous year. The construction payments by water users were $3,455,764.69, an increase of $784,221.79 compared with the previous year. The

total payments from water users in the fiscal year 1928 amounted to $5,299,149.55 compared with $4,260,-221.35 in 1927, an increase of $1,038,928.20.

Total funds made available for expenditure to the end of the fiscal year 1928 since the passage of the reclamation act of June 17, 1902, are summarized as follows:

Accretions to the reclamation fund to June 30, 1928:		
Public land sales	$108,984,737.45	
Oil leasing receipts	34,117,652.58	
Town lot sales	557,028.52	
Potassium Act receipts	40,167.12	
Receipts under Federal Water Power Act	42,008.04	$143,741,593.71
Special appropriations and bond loan	$20,000,000.00	
Less repaid	8,000,000.00	12,000,000.00
Collections for construction, operation and maintenance, and incidental operations		77,704,597.34
Total		$233,446,191.05
Disbursements		224,237,943.55
Balance		$9,208,247.50

CONSTRUCTION COMPLETED

An idea of the construction achievements of the Bureau of Reclamation may be obtained from a few of the figures of construction results at the end of the fiscal year 1928. The canals, ditches, and drains have a total length of 16,400 miles, or about two-thirds the distance around the earth at the equator. The volume of material in the storage and diversion dams of the Bureau amounts to 20,-883,300 cubic yards, equivalent to a block of concrete, earth, and rock 900 feet on a side and nearly 700 feet high, or more than six times the volume of the great pyramid of Cheops. The excavation work of the Bureau reaches the enormous total of 266,-826,100 cubic yards of earth, indurated material, and rock, equivalent to a single great excavation one mile on a side and nearly 260 feet deep. The capacity of the reservoirs created by the bureau totals 12,829,500 acre-feet, or enough to cover the State of Maryland with two feet of water.

At the end of the fiscal year 1928 the bureau had constructed 118 tunnels with an aggregate length of 31 miles; 104 concrete, metal, and wood flumes, totaling 160 miles in length; 1,678 buildings; 1,089 miles of roads; 88 miles of railroad; 3,350 miles of telephone line; 1,915 miles of transmission line; 245 miles of dikes and levees; 146,164 canal structures; 11,-332 bridges with a total length of 51 miles; and 13,520 culverts with a total length of 96 miles. It has developed power to the amount of 166,100 horsepower; laid 745 linear miles of concrete, metal, tile, and wood pipe; and placed 2,515,400 cubic yards of riprap, 1,069,000 square yards of paving, and 4,011,800 cubic yards of concrete.

CONSTRUCTION PENDING

Guernsey dam on the North Platte project, Nebraska-Wyoming, and Stony Gorge dam, on the Orland project, California, have been completed. Gibson dam, on the Sun River project, Montana, was about 60 per cent completed at the end of the year, and work was well under way on the construction of Echo dam, Salt Lake Basin project, Utah. Work was continued on canal construction for the Kittitas division of the Yakima project, Washington, and a contract was entered into for the construction of Easton diversion dam on this division. A contract was also entered into for the construction of the Owyhee dam, on the Owyhee project, Oregon-Idaho. This dam when completed will be 405 feet high and will be the highest dam in the world, topping by 43 the 362-foot Schraeh dam in Switzerland which wrested the record from the 349-foot Arrowrock dam on the Boise Federal irrigation project in Idaho. Contracts have also been awarded for the construction of a

DAMS UNDER CONSTRUCTION BY THE BUREAU OF RECLAMATION

Cost includes dam, spillway, outlet works, and bridges on dams, but does not include auxiliary features such as right of way, roads, and clearing reservoir site

Project	Name	State	Type	Max. Height	Crest Length	Volume	Estimated Cost
				Feet	*Feet*	*Cu. Yds.*	
Orland	Stony Gorge	California	Hollow reinforced concrete	125	863	43,144	$1,069,310.00
Owyhee	Owyhee	Oregon	Concrete arch-gravity	405	840	524,755	5,378,125.00[1]
Salt Lake Basin	Echo	Utah	Earth fill	130	1,900	1,461,000	1,645,500.00
Sun River	Gibson	Montana	Concrete arch	195	960	168,000	2,627,600.00
Vale	Harper	Oregon	Concrete gravity with earth and rock fill embankment	30	700	1,570 8,000	70,000.00
Yakima	Easton	Washington	Concrete gravity	70	248	5,900	200,000.00

[1] Exclusive of cost of constructing railroad.

diversion dam, earthwork, tunnels, and structures on the Vale project, Oregon. Work under all these contracts was being pushed rapidly at the end of the year.

The accompanying table gives data concerning the dams constructed and under construction by the bureau during the year.

RECLAMATION PROJECTS

Agricultural Results.—The irrigable area in 1927, the latest year for which statistics are available, of the reclamation projects constructed by the Government was 1,956,910 acres, an increase of 112,360 acres over that of the preceding year. The area irrigated was 1,378,990 acres, a decrease of 32,030 acres, owing to the larger area cropped without irrigation because of the unusual precipitation on the more easterly projects. The area cropped was 1,431,560 acres, an increase of 102,750 acres. The gross value of crops grown on these projects in 1927 was $72,047,200, an increase of $11,677,580 compared with the preceding year. The value of crops per acre was $50.33 compared with $45.43 for the preceding year and with $20.89 per acre in 1927 for the ten leading crops, comprising nearly 90 per cent of the acreage of all field crops, for the United States as a whole. In addition the Government irrigation works furnished water in 1927 under Warren Act or other water service contracts to 1,148,115 acres, of which 1,072,486 acres were cropped, producing crops valued at $61,160,010. Thus the total value of crops grown in 1927 on irrigated land furnished with water from the works of the Bureau of Reclamation was $133,207,210, an increase over that of the previous year of $23,087,550.

Crop Distribution.—Analysis of the statistics of crops grown in 1927 on the Federal irrigation projects shows that alfalfa led from the standpoint of acreage, being grown in that year on 438,675 acres or 31 per cent of the total cropped area of 1,431,560 acres. This crop was followed by wheat, 186,571 acres, representing 13.3 per cent of the total cropped

acreage, and cotton, 178,875 acres, which accounted for 12.5 per cent.

From the standpoint of value, cotton led with a crop value of both lint and seed of $16,705,727, or 23.2 per cent of the total value of $72,047,200 for all crops, followed by alfalfa hay, valued at $12,081,678, or 16.8 per cent of the total, and garden truck, valued at $7,707,525, or 10.7 per cent. Sugar beets were valued at $5,843,489, apples at $5,294,092, and wheat at $5,110,980.

The accompanying table gives a distribution by large groups of the crops grown on the projects in 1927.

Livestock and Equipment.—The total value in 1928 of livestock and farming equipment on the 24 operating Federal irrigation projects amounted to more than $36,800,000. A recent census shows that there were on the projects 77,842 horses valued at $4,027,610; 10,015 mules, $854,971; 61,823 beef cattle, $3,154,176; 118,944 dairy cattle, $8,789,600; 307,398 sheep, $2,864,960; 112,936 hogs, $1,111,982; 2,068,812 chickens, turkeys, ducks, and geese, $2,392,593; 41,118 hives of bees, $270,325; and 1,352 rabbits, $2,231. Including the value of purebred and scrub sires of beef and dairy cattle and the value of brood sows, the total livestock value amounted to $24,011,218; and that of farm equipment to $12,821,252. This was an increase of more than $4,000,000 over the value of livestock and equipment in the preceding year.

CROP ACREAGE AND VALUE, 1927

	Acreage Cropped		Value		
	Total	Per Cent	Total	Per Cent	Per Acre
Cereals	348,018	24.3	$ 8,077,789	11.2	$ 23.21
Other grain and seed	47,441	3.3	1,697,026	2.3	35.77
Hay and forage	838,184	59.0	16,707,549	23.1	19.93
Vegetables and truck	118,844	8.3	13,027,469	18.0	109.61
Fruit and nuts	46,332	3.2	9,213,536	12.8	198.86
Sugar beets	61,963	4.3	5,843,489	8.1	94.30
Cotton lint and seed	178,875	12.5	16,705,727	23.2	93.40
Other miscellaneous	54,148	3.8	368,635	0.5	6.81
Duplicated land acreage	275,225	19.2	.....	.....	.....
Total	1,431,560[1]	100.0	72,047,200[2]	100.0	50.33

[1] Includes 12,980 acres, statistics for which by individual crops were not compiled.
[2] Includes $405,980, statistics for which by individual crops were not compiled.

SETTLEMENT

Cost of Development.—The most difficult problem confronting reclamation is the successful settlement of the projects and the development of a sufficiently profitable agriculture to repay the cost of reclamation over a period of years. It has been estimated that the cost of developing and equipping an 80-acre farm, exclusive of the cost of reclamation, varies from $5,000 to $10,000. The records of the Bureau of Reclamation show that more than 50 per cent of the applicants for farms on the projects have only $2,500 or less.

Credit Needs.—To supplement this, long-time credit at a low interest rate should be available. The Federal Farm Banks will loan only on developed and patented property. Local banks loan for short periods only and at rates of interest too high for the ordinary settler to meet. The situation calls for the establishment of a credit fund, either by the Federal Government, the States, or some private agency, which may be used, under adequate safeguards, to supplement the usually meager capital of the settler and thus enable him to bring his farm into production in the shortest possible time and establish himself as an asset in the community. Funds should also be available for the preparation of the land for crops before settlement takes place, and for the erection of necessary buildings, payment for which should be amortized over a long period. The

fundamental factors of an adequate settlement program involve a thorough classification of the land to be reclaimed, careful selection of settlers, reasonable prices for the land with payments spread over a long period of time, long-time loans at low interest rates, expert advice in farming operations, and the development of coöperative buying and selling organizations on the projects.

NATIONAL CONFERENCE

On February 14 and 15, 1928, a settlement and development conference, called by the Secretary of the Interior, was held in the auditorium of the Interior Department. The conference was attended by a large number of influential and well-informed men, representing a cross-section of individuals and organizations interested in the problems of Federal reclamation and in safeguarding the investment of the Government. One of the outstanding features of this conference was the unanimous endorsement given to the bills introduced in the Senate and House of Representatives providing for aided and directed settlement, "the enactment of which and the appropriation of the funds requested therein would enable the Bureau of Reclamation to demonstrate on a small scale the efficiency in this country of legislation which for many years has been part of the reclamation and settlement laws of numerous foreign nations having similar problems, it being the belief that such aid in settlement will increase the number of farm owners on projects and lessen the evil of tenancy."

PUBLIC LAND ENTRIES

During the year the Bureau opened to entry 8 public land farm units on the Tule Lake division of the Klamath project, Oregon-California, and 28 units on the Willwood division of the Shoshone project, Wyoming. At the close of the year many of these units had been entered by settlers carefully selected by the project examining boards on the basis of approved qualifications of industry, experience, character, and capital. Qualified settlers had purchased all of the farms in private ownership containing habitable dwellings on the Belle Fourche project, South Dakota, the Lower Yellowstone project, Montana-North Dakota, and the Orland project, California, on which the Bureau held options for their sale at prices fixed by independent appraisal on amortized payments over a period of 20 years. The selling program was still under the handicap of the lack of houses and other farm buildings on many of these otherwise desirable farms.

On the 24 operating projects there are 38,428 irrigated farms, with a population of 143,227. The 207 project cities and towns support an additional population of 429,683. Project schools number 685; churches 683; and banks 135 with deposits of $137,487,000.

LEGISLATION

Rural Organization in the South.—As a result of the studies made by the Bureau of opportunities for reclamation and planned group settlement in the South, bills were introduced in both the Senate and the House of Representatives for the creation of organized rural communities in the States of Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Texas, and Virginia, to demonstrate methods of reclamation and the benefits of planned rural development, and authorizing an appropriation of $10,000,000 to carry on the work. The House bill was reported favorably from the Committee on Irrigation and Reclamation, but no further action was taken prior to adjournment. Under an appropriation of $15,000 representatives of the Bureau continued their investigations of tracts of land in North Carolina and Florida, designated by the respective States for study, and also made an investigation of drainage in the Yazoo Delta, Mississippi.

BUREAU OF INDIAN AFFAIRS

The 84 active projects of the bureau comprise an area of 1,390,000

acres, of which approximately 690,000 acres are under constructed canals. Of the latter area 120,000 acres are irrigated by Indians, 114,000 acres constitute irrigated Indian leased land, and 132,000 acres comprise land owned and irrigated by whites. The cost of construction, operation and maintenance, and administrative expenses during the fiscal year 1927 amounted to $5,320,913.03, and the total cost of such items up to the end of the fiscal year amounted to about $42,864,500. Coolidge dam was completed during the year. Collections of charges from the water users to the end of the year amounted to $1,121,151.82 on construction, and $2,998,787.66 on operation and maintenance.

PUBLIC LANDS

By William Spry

Commissioner of the General Land Office

EXPLOITATION

Lands.—A review of the activities of the General Land Office during the past fiscal year evidences a continued interest in the public lands looking to the establishment of homes and development of natural resources. Comparatively little of the remaining public domain is of a character suitable for ordinary farming, aside from which the opportunity offered is that of acquiring small stock farms by improving the natural range under the provisions of the Stock-Raising Homestead Law. The area of the remaining public lands and its recapitulation by states is shown in a table on page 228, and in addition there is a vast area in Alaska, only a small proportion of which, however, is available for agricultural use.

Minerals.—The public lands are open to mineral exploration and those shown to contain metalliferous minerals may be acquired under the general mining laws. Under the leasing act of February 25, 1920, permits may be obtained to prospect the public lands for coal, oil, gas, phosphate, and other like minerals, or leases on a royalty basis for lands shown to contain those minerals. In addition to the 193,847,240 acres of unreserved public land, there are subject to the laws relating to minerals more than 134,000,000 acres set apart and reserved for national forests, reserved mineral deposits in nearly 19,000,000 acres patented under the Stock-raising Homestead Act, coal deposits in 10,500,000 acres, and oil, gas, phosphate, etc., in 1,250,000 acres.

ENTRIES

During the year public lands were opened to entry through release from segregation or withdrawal to the amount of 130,927 acres, and through survey or resurvey 1,357,052 acres, all subject to preference right of entry by veterans of the World War as provided by public resolutions of February 14, 1920, January 21 and December 28, 1922.

SALES AND LEASES

The total cash receipts from sales, leases, and other disposition of public lands, including $515,687.83 from sales and leases of Indian lands, were $6,710,454.84, the source of which and disposition in the Treasury are shown in the table on page 226.

GENERAL LAND OFFICE

Total expenditures for the conduct of the business of the General Land Office, including expenses of the district land offices for salaries and commissions of registers and incidental expenses ($278,543.82) amounted to $2,190,197.57.

Land Grants.—The area of public and Indian land entered and allowed during the fiscal year aggregated 3,861,505 acres, of which 2,751,213 acres were allowed under the Stock-raising Homestead Act. The area patented (title granted) amounted to 2,477,867 acres, of which 1,927,869

SALES AND LEASES

Source of Receipts	Disposition in the Treasury			
	General Fund	Reclamation Fund	State Funds	Total
Sales of public lands	$ 101,217.97	$ 272,769.32	$ 15,582.28	$ 389,569.57
Fees and commissions	78,211.37	369,208.24	.....	447,419.61
Receipts under Mineral Leasing Act	469,167.72	2,454,730.51	1,753,378.93	4,677,277.16
Sales of land and timber in the Oregon and California railroad grant	486,375.05	.....	.....	486,375.05
Sales of land and timber in the Coos Bay wagon road grant	68,843.20	.....	22,947.73	91,790.93
Royalties and rentals from potash deposits	.....	7,425.58	.....	7,425.58
Sales of reclamation town sites and camp sites	.....	7,829.33	.....	7,829.33
Sales of timber, Alaska	7,448.54	.....	.....	7,448.54
Sales of town lots, Alaska	1,174.28	.....	.....	1,174.28
Royalties from coal leases, Alaska	3,809.79	.....	.....	3,809.79
Power permits	42,842.61	.....	.....	42,842.61
Copies of records	23,502.76	.....	.....	23,502.76
Proceeds of Government property	2,635.30	.....	.....	2,635.30
Miscellaneous	5,666.50	.....	.....	5,666.50
Total	$1,290,895.09	$3,111,962.98	$1,791,908.94	$6,194,767.01
Sales and leases of Indian lands	.....	.....	.....	515,687.83
Grand total	.....	.....	.....	$6,710,454.84

acres were patented under the homestead laws. In addition Indian fee patents were issued to the amount of 174,000 acres, supplemental patents releasing coal reservation under act of April 14, 1914, 68,177 acres, and Oregon and California railroad land grant timber sales, 7,386 acres.

Field Service.—Field examiners investigated and reported on 17,657 cases, of which 5,333 were reported adversely and 12,324 favorably. There were held 333 hearings on government contests, and civil suits in 64 cases were recommended to the Department of Justice. Indictments for offenses against the public land laws were returned in 21 cases, and of the criminal cases tried, 11 convictions resulted. The field service expended $18,475.24 in cooperative work in the prevention and fighting of forest and other fires on the public lands.

Surveys.—The Cadastral Engineering Service, which surveys the public lands, executed original surveys and resurveys under the rectangular system in 22 public land states and the Territory of Alaska. So much of the work as may still be gauged on a mileage basis aggregated 19,317 miles, which were surveyed at an average cost of $20.87 per mile. Numerous miscellaneous surveys were made, including 89 field investigations of erroneous and fictitious survey conditions; to determine riparian conditions resulting from accretions and avulsions; to define swamp and overflow lands; and to return lands erroneously omitted at the time of original survey. Under this head may be included also the survey of 57 islands, 14 mineral segregation surveys, and in Alaska 7 town sites, 2 cemetery sites, 1 military reservation, 16 isolated homesteads and 16 lighthouse reservations.

Extensive surveys for, and in cooperation with other agencies of the government were executed, and original surveys of lands in Utah deemed valuable for oil were continued throughout the year, as well as resurveys of the oil shale areas in western Colorado. The General Land Office accepted and placed on file plats representing 1,571,917 acres of original surveys of public lands, and 1,365,771 acres of lands resurveyed.

Maps.—The map of the United States, edition of 1927, has been printed and is ready for distribution. Maps of New Mexico and Michigan have been printed and issued. Maps of Minnesota and the north half o

California are in the hands of the contractor for printing.

MINERAL LEASING

Prospecting Permits.—Under the Mineral Leasing Act of February 25, 1920, 3,876 new applications for permits to prospect for oil and gas on the public domain were received during the year, and permits were granted on 4,402 applications. Thirty-six leases were issued to permittees who had demonstrated the existence of oil in the lands prospected.

There were received 1,367 mineral entries and 1,357 were disposed of; 85 potash permits were issued covering 157,307 acres and 14 sodium permits covering 21,421 acres. Coal prospecting permits to the number of 83 were issued, covering 100,468 acres, 37 coal leases covering 9,126 acres, and 8 coal licenses.

Receipts under the Mineral Leasing Act from bonuses, rentals, and royalties aggregated $4,677,277.16, the decrease as compared with former years being due to the low price of oil and the resultant curtailment of production. The largest receipts were from Wyoming, the amount being $2,940,-091, followed by California with $1,389,800.40. The other states in the order of receipts follow: Montana, $119,070.36; Colorado, $96,789.01; Utah, $58,081.38; North Dakota, $32,-740.14; New Mexico, $25,835.27; Washington, $3,976.86; Louisiana, $3,871.18; Alabama, $3,036.10; Idaho, $2,482.41; Nevada, $1,463.05; South Dakota, $40.00.

SPECIAL LEASES

Aviation Fields.—Increased interest in aviation has caused a demand for suitable aviation fields and airports, and leases have been made to a number of cities and towns under special laws. A law enacted May 24, 1928, provides general authority for leasing public lands for aviation purposes in areas of not to exceed 640 acres of contiguous land. All agencies of the United States operating air craft are to have free and unrestricted use of the airport, and if necessary for military purposes the Government may assume full control.

Grazing Lands.—In furtherance of the use of public lands and national forests for the grazing of stock, 5 new stock driveways were created during the year. The total gross area included in driveway withdrawals at the end of the fiscal year was 9,208,-453 acres. Instructions were issued for the leasing of land in Alaska for the grazing of stock, particularly reindeer, under a law enacted in 1927, and 3 leases were issued for land in that Territory to be used in the propagation of fur-bearing animals.

Rights of Way.—Numerous applications for rights of way over the public lands for railroads, stock watering reservoirs, irrigation and other purposes were presented and in process of adjudication during the year, of which more than 100 were approved.

Reclamation and Irrigation.—In the field of reclamation and irrigation the usual activity was maintained, involving the consideration of homestead claims on Federal reclamation projects, private irrigation projects, state irrigation districts, entries under the desert land law, reclamation by the states under the Carey Act, water development in Nevada under the Pittman Act, drainage entries in Minnesota and Arkansas, and state selections under the swamp land grant.

Adjudication of Claims.—Other important matters handled during the year included extensive adjudication of claims under the state school grants, particularly the act of January 25, 1927, enlarging the grants to include mineral lands; the adjustment of railroad land grants, in 13 of which the work was completed; sales of timber on the revested Oregon and California railroad grant lands amounting to $490,445, and on the Coos Bay Wagon Road lands, amounting to $82,460; auditing and certifying for payment the claims of certain counties in Oregon for amounts in lieu of taxes on the Oregon and California revested lands mentioned above. Other items of work accomplished are too numerous to be specifically mentioned herein.

AREA OF PUBLIC LANDS. RECAPITULATION BY STATES

(In acres)

	Surveyed	Unsurveyed	Total
Arizona	9,473,000	8,726,100	18,199,100
Arkansas	218,911	.....	218,911
California	14,662,147	5,759,936	20,422,083
Colorado	6,907,931	809,190	7,717,121
Florida	4,282	7,224	11,506
Idaho	8,812,472	1,952,385	10,764,857
Minnesota	214,340	.....	214,340
Montana	6,980,238	212,080	7,192,318
Nebraska	28,623	.....	28,623
Nevada	31,449,940	22,429,018	53,878,958
New Mexico	15,617,800	1,251,800	16,869,600
North Dakota	126,474	.....	126,474
Oregon	13,331,292	92,411	13,423,703
South Dakota	396,200	.....	396,200
Utah	13,501,694	12,493,262	25,994,956
Washington	861,935	15,986	877,921
Wyoming	16,729,273	781,296	17,510,569
Grand total	139,316,552	54,530,688	193,847,240

Legislation.—Developments of the past year have revealed no need for radical changes in or additions to the public land laws other than further to sustain the wisdom of enacting legislation to govern the development, use and disposition of the public grazing lands, bills to accomplish which are pending before Congress.

LAND TITLES AND RESTRICTIONS

By Helen C. Monchow

Research Assistant, Institute for Research in Land Economics and Public Utilities

Nature of Land Title.—Land titles may be regarded as the evidences of land ownership. A landowner's title is his authority to hold a given piece of property, or to exercise certain rights and duties with respect to that land. The important element is the extent of these rights and duties or the degree of interest which the landowner has in the land to which he holds title. In law these rights are referred to as an estate in land. The largest estate known to law, which is at the same time the most common form in use in the United States, is an estate in fee simple. Such an estate gives to its holder the largest possible bundle of rights in the land; but even so, the ownership conveyed is not absolute. Various forces operate to regulate what the landowner may and may not do with his land.

Regulation of a landowner's activity may be carried on by either public or private agencies. Public regulation in the form of legislative or constitutional control is exercised through the police power of the state, and the powers of eminent domain and taxation. Police power regulation through such devices as building codes and zoning ordinances is a familiar type of control. Taxation, although comparatively little used as a regulatory measure in the United States, has obvious potentialities for controlling the activities of landowners. Eminent domain controls by dispossessing the landowner when his land is needed for some public purpose. By any or all of these means, the state may limit what a landowner may do with his land.

Private Restrictions.—The most important form of private control is

that exercised through restrictions in deeds. An important attribute of an estate in fee simple is the right of the owner to dispose of his land, within certain limits, as he sees fit. If, for one reason or another, he wishes to place limitations on his grantee's use of the land, he may do so under the right of free contract by inserting restrictive covenants or conditions in the deeds conveying the property. Restrictions of this kind are often used and are becoming more common, chiefly in subdivision developments. They have important bearing not only upon the rights and duties of the lot owner but also upon the city pattern. Their relation to city planning and zoning promises many interesting legal and administrative problems for the future.

Restrictive clauses in deeds may be classified roughly into two groups. It is possible here only to indicate briefly the general nature of some of the more important restrictive clauses in each group. The major portion of the restrictions in the first group has to do with regulation of the physical development of the area. Among these are building line restrictions, which determine the location of the houses on the lots; requirement that the subdivider or an agent designated by him shall approve plans of all buildings to be erected in the subdivision; the reservation of easements for installation of utilities; and the stipulation of what types of land uses shall be permitted and where they shall be located.

The second or administrative group covers such points as duration of the restrictions and the procedure for their extension; provisions for enforcement; certain specific statements as to the powers and duties of the subdivider; and provisions for the administration of details, such as collection and expenditure of maintenance charges for upkeep of certain community features.

Another very important type of restriction which does not fit into the above grouping is that which limits occupancy of the property by, and/or transfer of the property to, persons of the Caucasian race. Clauses of this nature are being used more frequently. Restraints on occupancy are rather generally upheld by the courts but the separate states differ widely in their attitudes toward restraints on alienation.

Legal Status.—Such clauses inserted in deeds clearly limit what a landowner may do with his land. Yet the courts will uphold such agreements in spite of their general antipathy to any measures which appear to obstruct free use of the land or its free alienation. Certain standards must be met, however, in order to secure judicial approval. The courts will not require fulfillment of restrictive covenants if the character of the district has so changed as to make such enforcement inequitable. Moreover, restrictions must not be "unreasonable" or opposed to public policy; they must show clearly the intention of the parties to the contract; and their position is materially strengthened if they show evidence of having been drafted in pursuance of a "general scheme" for development of the area.

Zoning.—In short, the legal status of deed restrictions seems to be firmly established. Even in the few cases on record, involving conflicts with zoning, i.e., where the property is already subject to deed restrictions at the time zoning control is imposed, restrictive covenants have been considered as creating property rights which are enforceable as long as they are not opposed to the public welfare and are not inequitable in their operation.

Land Uses.—The economic significance of restrictions lies in their effectiveness as devices for controlling the relationships of parties to land transactions and through these the uses to which land may be put. From the point of view of the subdivider, deed restrictions help him to achieve his three major aims: (1) the highest possible prices for his lots consistent with (2) quick turnover of the subdivision property, and (3) a complete and economical development. The lot purchaser, on the other hand, secures through restrictions protection of his investment and amenities

for his home site, with the possibility of increased value if the restrictions are properly tuned to the development of the city. These results are, of course, predicated on the assumption that the subdivider is seeking, not merely to dispose of lots, but to lay the foundation for a community of homes and that the lot purchaser is buying a site for a home, not for speculative purposes.

From these observations it seems likely that deed restrictions will continue to be an important force in controlling the development of urban land. They constitute a control device which is available to all and which is adaptable to a variety of situations. The attitude of the courts is fairly clearly defined in all jurisdictions, and subdividers and purchasers are familiar with this method of control and feel confident of its permanency and soundness.

PUBLIC SERVICE COMMISSIONS

By John Bauer

Director, American Public Utilities Bureau

FUNCTIONS AND POWERS

Scope and Character.—A public service commission functions within the specific powers and duties imposed by statute. It combines all three of the constitutional functions of government: legislative, judicial, and administrative. It has definite powers to impose restrictions or obligations upon a company, and in all such matters it acts in a legislative capacity. Any such order, however, may affect the constitutional rights of a company or the public; hence, the commission is clothed with quasi-judicial powers to pass upon such rights. Its normal procedure is that of a public hearing, where testimony is taken and interested parties appear; it acts as a court, but with less formal rules. It is also an administrative body, with the responsibility of carrying out the provisions of the regulatory statute as well as the mandates of its own orders. The bulk of the routine work on the part of the staff is administrative.

Difficulties Involved.—This combination of powers is pratically inevitable, but it is extraordinary under our governmental system. It involves serious difficulties, and often creates a conflict of responsibilities. Administrative effort does not always harmonize with accepted standards of judicial procedure; desirable legislative action may be hindered by judicial and administrative considerations. It is difficult to represent and promote actively the public interest, and at the same time act as judge upon the rights of the affected parties. Because of the constant presence of such conflicting duties, there is the desirability of providing explicitly in the statutes for the standards and machinery of regulation, greatly reducing the legislative and judicial responsibilities, and making regulation more a matter of administrative organization and activity.

Public Service and Rate Fixing.—The specific functions of a commission may be classed as primary and secondary. There are two primary functions, which are in a large measure interdependent. The first is to insure the public proper service; the second, to fix reasonable rates. The secondary functions include the collection of data and the supervision of activities, to enable the commission to perform the primary responsibility of providing proper service at reasonable rates.

Safeguarding Investors. — Secondary functions consist of the control of security issues, the regulation of accounts, the requiring of regular operating and financial reports, and providing for the inspection of properties and service. The control of security issues may be regarded as a means by which rate-making may be effectively exercised, but it may be viewed also as a special purpose to

safeguard investors against loss in unjustified expenditure of capital. The usual basis upon which new securities may be issued is the actual cash capital or its equivalent devoted to the property, except that refunding or reorganization is ordinarily based upon previously existing issues. The object of such restriction is to prevent overcapitalization, both for the protection of investors and for the determination of investment for rate-making purposes. The effectiveness of this phase of regulation has been largely impaired by the failure to place holding companies under like control, and by the further failure to use the results directly as the basis of rate-making.

Regulation of accounting includes the prescription of uniform systems for the various utilities, as well as the supervision of actual accounting records. The chief object is to have reliable data for use in rate-making. The prevailing systems of accounting provide for complete showing of both "balance sheet" and "operating" accounts. The former set forth the assets and liabilities in the usual accounting form, and purport to show the investment in the properties used in the public service. The second show particularly the revenues, the operating expenses and taxes in connection with the operation of the properties. Under prevailing standards of rate control, the operating accounts are used directly for rate-making. But the "balance sheet" accounts, relating to investment, are practically disregarded. If they were used directly, the entire process of rate-making would be greatly simplified and much more satisfactorily administered.

RATE CONTROL

Standards Employed.—Rate control, up to date, has not been carried out effectively. The difficulty has been the lack of definite standards. The statutes make the general requirement that rates shall be reasonable, but do not set up a definite measure of reasonableness. Common practice, however, has established the standard that reasonable rates must cover all necessary operating expenses, taxes, and bring a fair return upon the "fair value" of the property used in service. The procedure of fixing rates has been reasonably satisfactory so far as the first two factors are concerned. Operating expenses and taxes are shown usually with sufficient exactness in the accounts that they can be taken directly for rate-making purposes.

Difficulties of Procedure.—The determination of the return allowed upon the properties has been the occasion of a great deal of difficulty. The basis of its determination has not been defined with sufficient precision, and the facts upon which it is predicated cannot be established and maintained with exactness for administration. The determination in each case arouses a sharp conflict of interest between the public and the company. This results in dispute as to what particular factors shall be included, as to what weight shall be attached to each, and even as to how each item is to be computed. Instead of clear policy and exact facts, there is opinion and conjecture. The procedure of rate-making is thus extremely cumbersome, costly and unsatisfactory.

FAIR VALUE

Property Valuation.—During recent years, the issue in rate cases has centered particularly upon whether the valuation of the property should be based, as a starting point, upon the reproduction cost, or the actual cost of the properties. This issue has never been explicitly decided by the courts, although certain expressions in recent opinions by the Supreme Court of the United States indicate that substantial weight must be given to reproduction cost. As the law stands today, however, "fair value" does not depend upon any single factor, and is not to be fixed by any formula. It is to be determined according to the facts of each case, and each element is to be given such weight as may be justified under the particular circumstances. While both reproduction cost and actual cost are recognized factors, their relative weight has not been decided, and the

determination is left without principle being fixed to each individual case.

Definite Rate Base Needed.—Under this state of undefined rights and unclearness of fact, every effort at rate adjustment inevitably arouses a conflict of interest. To make regulation effective, it is necessary to define exactly the rights of the investors and the obligation of the consumers, and to provide for the determination of the rights upon exact facts which are promptly ascertainable. This requires the abandonment of the vague standard of "fair value," and calls for the establishment of a definite and non-variable rate base in each instance. It probably requires legislative action to define and prescribe the policies and methods to be followed. Every existing property should be appraised and a definite amount established. This should be taken upon the accounts and kept unchanged, except as definite additions or retirements are made, and as further depreciation accrues under the supervision of the commission. The rate base upon which a return is to be allowed would thus be shown constantly by the accounts. It would be promptly ascertained as an exact quantity, without dispute, and the confusion of rate-making would be removed.

If such a definite rate base were established, the rights of the investors and the public would be definitely shown and rate adjustments could be made promptly, upward or downward, according to circumstances. There would be no dispute as to basic rights or as to the facts. Rate-making would be practically an automatic process, and would become almost wholly administrative in character; judicial functions would practically disappear, through definite administrative standards.

Reproduction Cost.—What is necessary is to start with an initial valuation of each property at a given date so as to resolve once for all the uncertainties existing at that time. For such determination, a substantial allowance for reproduction cost would doubtless have to be made in many instances. The amount would have to be fair and reasonable, and would have to be fixed in recognition of the fact that it would be kept unchanged in the future, notwithstanding subsequent changes in price level or cost of reconstruction. So far as past installed properties are concerned, it would remain an exact and non-variable quantity, entered in the accounts, and properly maintained through repairs and allowance for depreciation. The amount would be added to only as further investments are made in extensions and improvements. The actual cost would be added in the accounts, and a definite rate base would be constantly maintained.

St. Louis & O'Fallon Case.—The entire issue of an undefined and variable "fair value" as against a fixed rate base is up before the Supreme Court of the United States in the so-called St. Louis & O'Fallon case. This involves railroad valuation under the administration of the 1920 Transportation Act, and may thus be differentiated from other utilities under state regulation. The question, however, does involve the basic legal right whether a company is entitled to have its return based upon the reproduction cost of the properties, or whether a definite rate base can be established in the interest of effective administration and for the purpose of maintaining financial stability in the industry. The Interstate Commerce Commission in that case adopted the policy of a definite rate base. If it is sustained by the Supreme Court, the decision will point the way to the states to place general public utility regulation upon a similarly definite and effective basis. With appropriate legislative action, this will make possible the adoption of practical policies and methods, the elimination of incessant litigation, and the removal of dissatisfaction which endangers the continuance of the system of regulation.

COMMISSIONS HANDICAPPED

Too Much Work.—The inordinate amount of time and energy devoted to rate litigation has prevented the commissions from devoting needed at-

tention to other aspects of regulation. Even as to rates, they have been concerned so largely with valuations that they have given little attention to rate structures, to classification of rates, or to cost analyses needed for proper rate diversification. They have not succeeded in advancing the standards of service, and, particularly, have not been active in promoting efficiency and economy of operation.

Inadequate Financial Support.—Apart from inappropriate policies and methods, the commissions also have been greatly hampered by inadequate financial support furnished for their work. The commissioners themselves are grossly underpaid, so that the positions are not sufficiently attractive for thoroughly qualified men. The salaries for engineers, accountants, analysts and other technical positions are so low as to prevent the development of competent staffs. The number of positions is far from enough to meet the reasonable requirements of the work, if properly done. There are, of course, noteworthy exceptions. For the most part, however, the commissions are struggling with unmanageable duties. Under existing conditions they do not and cannot represent the public interest entrusted to them by law. The dissatisfaction with the commissions is commonly used already as an argument for public ownership and operation as against the system of private ownership with public regulation.

MUNICIPAL OWNERSHIP

By H. M. Olmsted

Associate Editor, *The American City*

DISCUSSION AND INVESTIGATION

Federal Trade Commission Probe.—Discussion of municipal ownership as a policy became more active and widespread during the past year as a phase of the question of public ownership, national and local, which was a part of the Federal Trade Commission's investigation into the publicity methods and objectives of utility companies. The investigation referred to was instituted in response to a resolution introduced in the Senate by Senator Walsh of Montana, and approved Feb. 15, 1928. It was originally proposed that it be conducted by a Senate Committee, but this was effectively opposed by the electric companies and others, and the work of the inquiry was turned over to the Federal Trade Commission.

Utilities Propaganda.—The Commission proceeded to prosecute a very thorough investigation, through questionnaires, correspondence, field workers and public hearings, which is continuing through the winter of 1928-1929. In the course of the inquiry it has developed that utility companies, and intercompany associations and agencies, have engaged in a thoroughgoing and widespread campaign of propaganda, opposing municipal and governmental ownership, defending state regulation as now practiced, proclaiming the achievements and announcing the services of the companies and attempting to strengthen their public relations. These efforts have been exercised through pamphlets and books, newspaper publicity, speakers' bureaus, etc., with many instances of influence extending into schools and colleges, through subsidized instructors, censored textbooks and courses, and free supplementary material.

PUBLIC AND PRIVATE ENTERPRISE

Consolidations.—The process of consolidation of electric systems under private ownership has kept on apace, and special efforts are still being made to acquire municipal plants, as well as to discourage and prevent the establishment of new ones. The past year saw many purchases of existing plants, some of them at prices far above cost, as had been done previously in many places.

Municipal Activities.—On the other hand, the establishment of new municipal enterprises has by no means stopped. Both hydro-electric and fuel projects continue to be undertaken, particularly those with Diesel engines; the latter form of oil power is in many instances replacing outdated reciprocating steam-engines in existing municipal plants as well. Some cities have moved toward the acquisition of plants, to compete with existing private companies, by entering into contracts with companies that will build plants and turn them over to the municipalities after the cost has been recouped out of earnings. The economies of the large modern steam plant, while a cause of many purchases of municipal plants by the large companies, are also being taken advantage of by cities obtaining power over transmission lines fed by private or public plants in larger places, without selling their distribution systems or existing power-plants.

Municipal Electrical Systems. — The net effect as to the total number of municipal establishments (either generating or purchasing power), over a period of years, is very much in doubt; but the quinquennial census of electrical industries, which was being worked up by the United States Bureau of the Census during the year, will provide an answer sometime in 1929. The trend of electric generating and transmission practice, and indications in various states, would make one expect that the 2,581 municipal electric light and power establishments, as reported by the Census Bureau, for 1922, would be appreciably reduced in number. The first report of the Census Bureau, on any state, and the only one issued up to time of writing, shows, however, for Kansas, a net increase of one, over the five year period, from 215 to 216. Kansas probably has the largest number of municipal systems of all the states. It is, of course, hardly likely that all of the others will show increases. There are no data as yet on the proportion of power distributed by municipal systems; in 1922 it was 4.9 per cent of the total power output of the country.

COURT CASES AND LEGISLATION

Municipal Competition. — Methods of opposition to municipal competition by companies affected included during the past year, the obtaining of temporary injunctions—later dissolved—to prevent the sale of equipment to certain municipal plants by an engine-manufacturing company. In Jamestown, N. Y., efforts were made to compel the long-established and successful municipal plant to raise its rates, on the claim that various items of expense that might properly be charged against the plant were not so charged.

Resources and Regulation.—In the state of Wisconsin a committee of the legislature has been studying the hydro-electric resources of the state, the relative cost and efficiency of municipal and private plants, and the problem of regulation, and has given special attention to Ontario Hydro-Electric Power Commission's system.

Fare Case in New York City.—In New York the subways remained the center of great controversy, with particular reference to plans for unification, and the efforts made by the Interborough Rapid Transit Co. to obtain an increased fare. The latter attempt presents an issue of great interest to cities owning utilities, but contemplating their lease to private companies for operation. It has been assumed that the contracts between the city of New York and the two subway-operating companies were inviolable, in every respect, including the 5-cent fare, which was considered a fundamental feature both as to the agreement and as to the city's policy of population dispersal, on which the subway construction and the operating contracts were based, at least in part.

The company raised the contention that the Public Service Commission law, passed after the original subway contracts but before the two more recent ones, and generally regarded as covering a separate field, applies to the subways, and that the first two contracts are absorbed or superseded by the last two, thus placing all the subways under commission regulation and making the fare subject

to the vagaries of "fair return on fair value." The Federal court approved their contention and authorized a 7-cent fare. The city obtained a stay from the United States Supreme Court, which has heard the case on appeal but eventually ordered a rehearing in January, 1929. The company incidentally contends for the principle that not only its own subway property—chiefly equipment—but also the city's property, constituting the great bulk of the subway itself, is subject to valuation on the reproduction cost basis, and the setting of a rate of fare to yield a "fair return" thereon. The elevated lines that the Interborough company operates under an unfavorable base from another company are also claimed as belonging in the scheme.

Interborough Operation.—The legal battle over subway fares and contracts overshadowed the matter of unification, or the separate treatment of the new subways under construction, which subjects had been under discussion theretofore; the outcome of the court proceedings would naturally affect the city's policy. The question of operation, private or public, was a particularly mooted point. Mayor Walker expressed himself as not favoring direct public operation, but said that a victory by the company in the fare case might force the city to adopt a policy of public operation. During November a special committee of three members of the Board of Estimate,—Mayor Walker, Comptroller Berry, and President McKee of the Board of Aldermen, were studying the unification plans proposed by Mr. Berry and by Samuel Untermyer, special counsel for the state Transit Commission. The Berry plan would set up a transit authority somewhat similar to the Port Authority, to take over the system whenever unification might take place and lease it to a private operator. The Untermyer plan proposed a public corporation with a board of directors of four city officials, *ex-officio*, and 15 members appointed for overlapping ten-year terms, the corporation to be owned by the city and empowered to issue bonds for acquisition and construction, with purchase of the Brooklyn-Manhattan Transit Corporation's rapid-transit system contemplated, and recapture of such of the Interborough system as this method could be legally applied to.

TRANSIT LINES AND POLICIES

Philadelphia completed the North Broad Street subway, and operation thereof was begun under a 90-day lease to the Philadelphia Rapid Transit Co., dating from September 1, and subject to extension month by month. The three-months experimental period is expected to provide a basis for the preparation of a two-year lease, during which period the South Broad Street extension is expected to be placed in operation also and furnish cost and traffic data for a subsequent agreement.

Boston.—The year marked the completion of the first ten years of state control, with private ownership, of the Boston Elevated Railway system (of elevated lines, subways, street cars and buses). The loan of $3,980,157 assessed against the cities and towns served, as a result of a deficit the first year of operation, was reduced to $1,349,333; stockholders have received their fixed schedule of dividends, and greatly improved rolling stock has been provided, despite almost a doubling in the cost of labor over the period. Much discussion as to the proper plan to follow with regard to the Boston system, after this period, took place in and out of the state legislature.

San Francisco continued to be a focal municipal ownership point. Next to taking over the privately owned water distribution system referred to later, the chief interest attached to the impending expiration of franchises of the Market Street Railway Co., owning and operating the greater part of the street railways, and the prospective acquisition of these lines by the municipal street-railway system. An attempt was made, under the initiative, to pass a charter amendment that would substitute what the friends of the amendment called revocable permits, and its opponents, perpetual franchises, for

the expiring grants. This move, it was claimed, would have prevented purchase of the company's lines by the city except as a whole, and at a price agreeable to the company, or by condemnation. The measure was decisively defeated at the November election.

At the same time two other amendments bearing upon utilities were also voted down, one being a proposal to establish a local public utilities commission of three, to be appointed by the mayor, with jurisdiction over all publicly owned and operated utilities; the other would have aided the financing of public-utility acquisitions, or of the extension of municipal utilities, by means of bonds to be authorized by majority instead of two-thirds vote, and to be payable as to both principal and interest out of earnings, thus removing them from the city's debt limit. The city lines, which formerly were able to meet bond redemption charges in addition to operating expense, depreciation and interest (the municipal system is not taxed), out of the 5-cent fare, have not been able to do so for the last two years, and the superintendent has recommended that depreciation funds be used to meet the difference until 1934, when half of the bonds will have been redeemed. The private lines have had a diminishing annual surplus after operating, taxes, depreciation and interest, but have paid no dividends for several years.

Detroit entered upon its eighth year of full municipal ownership and operation of its street railways, having successfully met out of earnings all of its operating, tax, interest and amortization requirements, paying off or accumulating funds for $13,775,656 of its debt and setting up accrued depreciation of over one-third that amount, in the preceding seven years, at an average fare of six cents.

Seattle.—Seattle's municipal street railway continued to be the subject of much local discussion, with proposals for refinancing to ease off the heavy financial burdens undertaken when the system was purchased, and to rebuild and reëquip it in an effort to meet the competition of the private automobile. Meanwhile other city-owned utilities have been called upon for loans to help out and generally to better the street-railway financial situation.

Chicago.—Ordinances were drafted in the fall by the City Council's transportation subcommittee, providing for city purchase of the surface and elevated lines by amortization over a period of 40 years, this proposal, however, being bitterly opposed by representatives of both of the systems. The proposed ordinance provided for initial capital of $265,000,000 and the expenditure of further sums for extensions, and betterments, which it was claimed would bring the total of stocks and bonds to $635,000,000 in 40 years. The company officials contended that amortization would place too heavy a burden on the car riders during the period. Other plans were proposed during the year for meeting the transit problem, including the matter of prospective subways, but no solution has been reached.

WATER SYSTEMS

San Francisco.—The largest privately owned water system of the country, that of the Spring Valley Water Co. of San Francisco, passed over to public hands through the approval at the polls of a $41,000,000 bond issue for its acquisition by the city. This will give the city a complete public water system, as it has in past years been developing extensive new sources of supply, in the Hetch Hetchy project, which, when completed in a few years will be combined with the Spring Valley distribution system. A bond issue of $24,000,000 for the completion of the Hetch Hetchy development was also approved at this time by a popular vote of over 8 to 1.

Los Angeles and ten surrounding cities voted overwhelmingly at the November election to form a metropolitan water district to bring a domestic supply of water from Boulder Dam, on the Colorado River in Arizona, when built.

SEWERS

Sewers have been assumed to be practically outside the category of public utilities in the narrow sense, and to be accepted as a tax-supported undertaking. They are coming under discussion to a slight extent as being proper subjects for charges on the basis of usage—measured by water consumption or otherwise—particularly where expensive sewage-disposal plants are required. Grand Rapids, Mich., at the November election, voted affirmatively, by a narrow margin, but without the necessary two-thirds, on the question, "Shall the City of Grand Rapids establish, operate and maintain its sewage disposal plant and system on a utility basis, charging therefor in proportion to the service rendered?" The same city has undertaken to place its public water system on the dubious basis of private water utilities, with charges calculated to produce an 8% return on "value" rather than on investment.

FINANCIAL PRACTICES

Wide differences exist among different cities as to financial and accounting practices of municipal uitilities in relation to each other and to other city activities. In some small towns, earnings of municipal electric plants are made to pay for all municipal operations, so that no local taxes are levied. In various other cases, particularly in transportation utilities, taxes are necessary to meet some of the utility charges; and there is considerable variety as to the handling of charges for services rendered by the utility to the city government, or rendered to it by the other city departments.

Discussion of these matters is current, many observers urging that each utility be kept as financially separate from other city activities as possible, and to pay its way entirely from its earnings. In some jurisdictions, state authorities undertake to regulate these practices and likewise the rates charged; instances have occurred during the past year. Much may be said pro and con as to various phases of the matter; for although reasonable uniformity of accounting practice would seem to be highly desirable, matters of financial policy involve questions of general social conditions in the locality, as well as of the practical financial problems of the city government as a whole. While study and comment as to these policies and practices is to be encouraged, official interference as to rates and broad financial matters by outside agencies tends to breed local resentment and suspicion as to underlying influences, and to hamper the constructive exercise of home rule.

STREET TRAFFIC AND REGULATION

By Ernest P. Goodrich

Consulting Engineer, New York

THE AUTOMOBILE FACTOR

Automobile registration continued its growth during 1928 about as shown in the following table:

Year	Passenger Cars	Trucks	Total	Annual Increase
1920	8,225,859	1,006,006	9,231,941	
1921	9,346,195	1,118,520	10,464,715	1,232,774
1922	10,864,128	1,375,725	12,239,853	1,775,168
1923	13,479,608	1,612,569	15,092,177	2,852,324
1924	15,460,649	2,131,332	17,593,077	2,500,900
1925	17,512,638	2,441,709	19,954,347	2,361,270
1926	19,293,112	2,844,222	22,137,334	2,182,987
1927	20,230,429	2,896,886	23,127,315	989,981
1928	21,468,596	3,123,774	24,592,370	1,463,055

Ownership Rates.—On January 1, 1928, there is computed to have been in the United States one motor vehicle for each 5.2 persons. On the same date in 1927, the number was 5, showing that the population grew faster than the automobiles for the first time in the history of the United States. Los Angeles has one registered automobile for each 2.3 persons. The gasoline consumption of the country apparently increased in a somewhat higher ratio than did the automobile registration, indicating a larger average mileage per car per year than heretofore.

Traffic Tallies.—Obviously this increased car use is one of the reasons for the observed increase in traffic upon the streets and highways. Tallies show that traffic on the streets of Los Angeles has increased practically in direct proportion to the registration. For example, between 1922 and 1928, tallies at the intersection of Wilshire Boulevard and Westen Avenue were 26,750 and 49,325, respectively. Statistics of the annual increase in the mileage of improved roads show that the latter is not increasing as fast as is motor vehicle registration. This fact gives another explanation for the traffic increase.

The death rate from motor accidents has shown an alarming increase each year since reliable statistics were first compiled. The rates per 100,000 population and per 100,000 cars registered have been as shown in the following table:

Year	Per 100,000 Population	Per 100,000 Registration
1920	10.4	119
1921	11.5 *	118
1922	12.5 *	112
1923	14.9 *	109
1924	15.7 *	100
1925	17.0 *	100
1926	17.9 *	95
1926	19.8 ‡	105 ‡
1927	21.6 ‡	111 ‡
1928	21.7 †	109 †

* 1928 Statistical Abstract.
† Estimated.
‡ Computed from Dept. of Commerce Reports.

Grade-crossing Accidents.—During the year, the Interstate Commerce Commission issued a report stating there were 5,640 grade-crossing accidents during 1927, involving 2,371 persons killed and 6,613 injured. For 1926, the figures were 5,890 accidents, 2,491 killed, and 6,991 injured. While some reduction was shown for 1927, it was stated that the only effective remedy will be grade-crossing elimination. It was reported in Baltimore that 19% of the traffic accidents occur on Saturdays. This figure is substantially proportionate to the volume of traffic on that day as compared with the other days of the week.

Safety Steps.—The better to educate the public with reference to the accident problem, Pittsburgh made use of leaflets entitled "Traffic Talks," in a campaign to reduce child fatalities from traffic accidents. In New York, a "Municipal Murder Map" was published showing the locations of all fatal traffic accidents for 1927. The Police Department there instituted in 1928 a system of investigation of each fatality, by a special squad. As one item in the nation-wide search for means of combating the accident menace, the Massachusetts Institute of Technology instituted a system of tests of the reaction time of drivers.

THE PARKING PROBLEM

Special Studies.—As traffic increases in quantity, the parking problem becomes more widely spread and more acute. Many organizations and groups made special studies, either in general terms or as to special local conditions. Under the first type, mention may be made of the pamphlet used by the National Safety Council entitled "Where, Shall They Park?" The United States Chamber of Commerce issued a bulletin giving the results of a study of the relation of parking to retail business districts. Fifteen reasons were suggested by the traffic engineer in Pittsburgh as to why "no parking" may be advisable under certain circumstances. In St. Louis, a study of this problem by the Director of Streets and Sewers led to recommendations for a by-pass street to carry through traffic, and the establishment of a municipal parking space on the levee.

Parking Areas.—A proposal was put forward in Cambridge, Mass., for the use for parking purposes, of a portion of the historic Common which, it was pointed out, was originally used for grazing purposes for horses, of whom the automobile is the historical successor. In Norfolk, Va., an oil and gasoline company agreed with the City to establish a parking area, provided the merchants would guaranty a certain minimum monthly purchase of supplies of oil and gas.

Garages in Office Buildings.—The result of the "no parking" regulations in the Loop District in Chicago appeared to be satisfactory because business actually increased and traffic moved at higher speed. The promulgation of such regulations in several cities increased the use of commercial garages and led to the development of the practice of incorporating in business buildings several stories of garage space for tenants and patrons. Eleven stories of the proposed Fisher Building in Detroit are to be so used, and many mercantile buildings in Los Angeles have been so erected.

CITY PLANNING

Radburn.—City Planning activities grew in volume and improved in their technique both as to the art and the science of planning, reacting favorably upon future traffic conditions. Construction work was actually commenced on Radburn, the "Town of the Motor Age," which is interesting from the fact that that municipality has been so planned as materially to reduce street traffic interference with pedestrians through the extensive use of *cul-de-sac* streets. This type of street was given strong advocacy by an eminent English town planner.

Utilitarian Improvements.—Many municipalities improved traffic conditions through better street lighting (Newark, N. J.), new pavements, the use of early strength cement, with work done at night to reduce interference with business and traffic, and in many other ways. It was pointed out that the creation of central heating plants in the outskirts with steam piped to the buildings in a large district would eliminate coal and ash trucks, thereby reducing traffic.

Street and Highway Conditions.—The city streets were characterized as the worst part of the state highway system in Kansas, and the legislature decided to contribute $250 per mile per year to all cities through which state highways pass. Snow removal work was extended in the northern cities and on the state highways resulting in much better winter traffic conditions. Salt Lake City marked the pavements in lanes at intersections, so as to secure double lines of flow at all times, resulting in an expedition of street traffic. Westchester County highway authorities will paint lane boundaries throughout the full length of several miles of highway, and erect signs to reduce the number of "middle of the road" drivers. A greater use of alleys was advocated in Detroit to relieve the street congestion. In Seattle, an improved rapid transit service was suggested as a means to reduce automobile driving and relieve the parking problem.

Express Highways.—A 130-foot eight-lane regional highway was advocated for New England before a meeting of the Massachusetts Federation of Planning Boards. A $60,000,000 motor express highway was proposed for Chicago to run in a northwesterly direction from the downtown district, over and adjacent to the tracks of the Chicago and North Western Railroad, and further progressive steps were taken looking to the creation of the $52,000,000 elevated highway on the west side of Manhattan, in New York. A somewhat similar elevated highway, 100 feet wide and two miles long, was proposed for St. Paul, to provide an arterial highway around the business district, to be located over railroad tracks and yards.

Intersections and By-ways.—Grade separations between intersecting heavy traffic highways were widely advocated and actually constructed in a few instances, notably along the parkways of Westchester County. The Philadelphia Regional Planning Federation published a report on "By-

Pass Highways for Traffic Relief" carrying arguments and proposals for seven trunk highways for the Tri-state District. Pittsburgh appropriated $125,000 to cover the cost of a flexible progressive traffic control system to be installed at one hundred intersections in the central business district. The Chamber of Commerce of Harrisburg was active in securing the passage of a $1,250,000 bond issue to cover the costs of traffic improvements.

TRAFFIC CONTROL

Legislation.—Changes in laws were advocated and enacted in some instances. For example, the centralization of traffic control in a superbody with its removal from local enforcement was strongly pressed for purposes of uniformity. New Jersey enacted a new traffic act which goes into greater detail than does the uniform vehicle code proposed by the Hoover Committee. The motor vehicle laws of Massachusetts were amended to require slowing down instead of sounding a horn when approaching a pedestrian.

Law enforcement was improved in San Diego, Cal., through a concentration of attention by the police on causes of accidents and prevention, and the Traffic Court was provided with an extremely useful street intersection model.

Design in Control Devices.—Improvements were made by the manufacturers in signs, traffic signal posts, traffic control dveices, and the esthetic appearance of their structures. Several consolidations took place among companies that manufacture street signs and signals, and new designs and devices were placed on the market.

Safety Measures.—Statistical studies show that uniform traffic control can be correlated with the reduction in ratio of accident incidence where traffic control existed, accidents increasing in less ratio than automobile registration. The *Public Safety Bulletin* of the National Safety Council continued its series of articles along educational lines with discussions of street traffic regulations, accident prevention, traffic division of police departments and other related items. The Commissioner of Motor Vehicles of Connecticut continued the issue of leaflets, among them one on "Proper Site Lines as Aids in the Reduction of Accidents," and others on a statistical examination of accidents in the state during the preceding year.

PUBLICATIONS AND MEETINGS

The report of the American Engineering Council Committee on Street Traffic Signs, Signals and Markings was issued in preliminary form through the public press. The professional engineering societies continued the publication of papers on highway and traffic matters, and the usual interesting meetings were held by the Highway Research Board, the National Highway Traffic Association, and other bodies. One subdivision of the Annual Safety Congress devoted its attention exclusively to traffic matters. The Regional Plan of New York and Its Environs published in final form its report on highway traffic which is Vol. III in the complete series. The final report was issued by the National Conference on Street and Highway Safety of its model municipal traffic ordinance. The report of the Highway Research Board contained data on causes and prevention of highway accidents, traffic analyses, including the method being used in the analysis of time, rate and capacity of two, three and four-lane roadways, and discussed the legal status of automobile lighting, the color and form of traffic signals in relation to safety, the railroad grade crossing hazard on rural highways, and the time loss at grade crossings.

The American Road Builders Association issued a statement to the effect that 22.3¢ in the cost of each gallon of gasoline was actually a "poor roads tax." A widely disseminated advertisement for a progressive company presented facts to show that poorly paved towns are avoided by motorists. Marcus Don, ex-president of the National Safety Council, published an interesting book giving hints to drivers from the lips and

philosophy of "Jim, the Truckman." During the year, a special competition was held among architects working toward better comfort stations, gasoline filling stations and refreshment stands along the public highways.

WATERWAYS AND HARBORS

By William N. Tyler and P. K. Sheldon

Associate Editors, *Port and Terminal*

INLAND WATERWAYS DEVELOPMENT

Pacific - Hawaiian - Great Lakes Route.—Initial shipments to and from the Great Lakes and Pacific ports and Hawaii on all-water bills of lading *via* the New York State barge canal are perhaps the most outstanding indications of an awakened interest in the value of our inland waterways which has made itself manifest in 1928. All Great Lakes ports will soon be reaping profits from the inauguration of a Pacific coast and Hawaiian route, *via* the New York State barge canal, with but one trans-shipment at New York. This beginning may be taken as the forerunner of a growing traffic over this route with trans-shipments either at Albany or New York between the smaller lake vessels and ocean freighters.

New York Barge Canal.—Domestic water-borne commerce in general is annually saving a half billion dollars in transportation charges. With this in mind, the fullest use of the Great Lakes and the barge canal in New York State is being justified in the fact that statistics show the commerce of these waterways is principally American and domestic. Westbound shipments on the barge canal are in excess of eastbound shipments, which fact is in a measure setting aside or at least weakening opposition to its development.

PORTS OF THE GREAT LAKES

Duluth and Buffalo.—Duluth-Superior continues handling the greatest volume of tonnage of any of the Great Lakes ports, while Buffalo leads in value of cargoes transferred. In water-borne commerce Buffalo is rated as the third largest receiving port on the North American continent, the outranking ports being New York and New Orleans. Buffalo is also a tremendous passenger center, having an average of 2,044,600 passengers a year during the past five years. As a grain center Buffalo ranks second only to Fort William in Canada. In capacity and equipment its warehousing facilities have few equals.

Toledo ranks as the third port in tonnage on the Great Lakes. At present its tonnage is made up principally of soft coal shipments, and most of these go to the head of the Lakes, at Duluth-Superior. Even for a distance of less than sixty miles, sufficient savings are made on soft coal shipments by water to render it economical to dump them into boats from cars at Toledo, bound for Detroit. Iron ore and grain go to make up the balance of Toledo's annual tonnage. In the past six years the seven members comprising the port commission have been directing their energies toward new improvements, acting in an advisory capacity.

Detroit has this past year been made the port of origin of shipments covered by all-water bills of lading *via* the Atlantic Seaboard to the Pacific Coast and Hawaii. Large quantities of sugar and other staple foodstuffs are also brought up from the Atlantic Seaboard by motor-propelled boats which return with export boxed automobiles and other freight.

THE MISSISSIPPI RIVER SYSTEM

Lower System Covers Loss of Upper.—With respect to the operations of the Mississippi River System, indications over the greater part of 1928 were that although the Warrior River and Upper Mississippi division

were operating at a loss, the lower system has been making enough money to cover it.

Dubuque Terminal. — What has been considered an epoch in the history of industry and commerce in the Middle West was the formal opening last August of a rail and river terminal at Dubuque, Iowa. This port's facilities have been described as the most modern on the Father of Waters. Through its terminal has already begun to pour a portion of the enormous output of the industrial district of which Chicago is the center, consigned to Pacific Coast ports, *via* the Panama Canal.

Pittsburgh Service.—Progress is being made also on the development of a service reaching from Pittsburgh, Pa., *via* the Ohio River and the Mississippi to Mobile, Ala., and other Mississippi ports.

ATLANTIC PORT DEVELOPMENTS AND PROJECTS

General.—The past year will also go down in history for the extent of port developments accomplished or projected. The huge sums allotted by the government and various municipalities will go a long way toward the needed deepening of harbors, building of docks and piers and the development of terminal systems. The South will be the greatest beneficiary of these allotments, while the greatest municipal and private developments will be found in the North and West.

Portland, Maine.—Ports along the Atlantic Coast that have showed the most marked development may well be started with Portland, Me. This once famous port was for a time allowed to lag, but during the past two years it has taken a decided step forward. At one time it was the winter outlet for Canadian grain and miscellaneous export traffic and the gateway for Canadian imports. These fell off from 1,057,912 tons in 1919 to 230,855 tons in 1926. A new trade with the Pacific Coast including canned goods, fruits, fish, lumber, paper, etc., with an increased coastwise trade has more than offset this loss. Portland is the nearest port in the United States to England and Europe and by rail the nearest port to Montreal. It has ten steamship lines to foreign ports besides a number to coastal points, and is served by three railways.

Boston.—Despite the fact that Boston is woefully lacking in being the terminal for railroads leading in from the West; its facilities in this respect being limited to two lines, while one cares for its northern and somewhat limited traffic, it ranks as one of the great shipping centers and ports of the Atlantic Coast. New England industries rely to an enormous extent upon water routes. Statistics for this port covering 1928 show a marked increase in the total water-borne commerce. This is particularly reflected by the recorded receipts of fish at the South Boston Fish Pier, where the aggregate pounds for 1928 were 222,513,195 compared with 198,172,590 for the year previous. A total of 605 more fishing vessels arrived than in 1927, and from foreign ports there came an increase of 41 steamers and schooners. The opening of the Cape Cod Canal and the improvements to its channels have attracted considerable shipping that went to other ports, while its great dry docks, capable of handling the largest ships afloat attract the large liners in need of repairs. Its harbor facilities have been greatly improved with new piers and wharves, and the consolidation of terminal facilities has done much toward bringing in freight of all kinds for interior as well as foreign and coastal shipment.

The Sound ports, notably New London, Bridgeport, New Haven and Providence, have reported a decided advance in domestic and foreign shipments in the past year, as well as in foreign exports and consignments to coastal ports. Government appropriations have greatly facilitated harbor improvements. These ports have been put in better condition to handle large vessels than at any previous time. A steady increase in all kinds of trade is looked for by the various chambers of commerce and port commissions. Certain of these ports are conspicuous in the handling of commodities related to local industries.

Thus, Bridgeport surpasses the other ports on Long Island Sound in the tonnage of brass and copper, pig and scrap iron, iron and steel manufactures and vehicles. Providence, which ranks first in water-borne commerce among the nine leading ports of southern New England, surpasses them all in handling cotton, wool and textiles, chemicals and drugs. New Haven leads in fertilizer and dyestuffs; New London in sugar, syrup and molasses; and Norwalk in woodpulp.

Bronx Borough, New York City, is becoming separated from Manhattan. With new railroad terminals, piers and warehouses it is attracting a large class of both domestic and foreign shipping. Its Board of Trade is catering to the coastal and export trade. If the Harlem ship canal is improved its advocates believe that the Bronx is destined to become a notable factor in handling the New York Harbor traffic.

Brooklyn.—Except for the great Brooklyn terminals the waterfront of Long Island has shown but little change in the passing of years. Brooklyn continues to increase its waterfront facilities with added warehouses, connections by rail with New England, and improved lighterage systems. Its terminal warehouses rank among the first in the country and have attracted varied manufacturing interests.

Manhattan and Jersey hold the supremacy for berthing the large transatlantic vessels. It is now becoming a question of creating piers of sufficient length to accommodate the new liners of 1000 feet and over, for which there will be an early need. The coastal trade from all sections of the Port of New York, the Port of Newark and other adjacent ports has shown a marked increase, which will be further developed when the canal is cut through New Jersey to Philadelphia. The deepening of the Hudson from Troy to Manhattan will open new traffic, and will tend to make Albany a port of entry. The tendency toward terminal consolidation is also proving beneficial to the Port of New York. The Port Authority has done much the past year in the equalization of rates and toward keeping New York on a parity with its rivals.

Trenton and Camden have come out of obscurity and are now recognized among the ports of the eastern coast with a good export and coastal trade, and with excellent railroad terminal facilities. Government aid in the deepening of channels on the Delaware has greatly helped in securing new marine commerce for these cities. Water transportation has already had a favorable effect on freight rates into and out of Trenton.

Philadelphia reports an increase in maritime trade of all kinds and many improvements in terminal facilities. The Delaware and Chesapeake Canal has proven beneficial to its water-borne commerce, making a short cut to Baltimore for shallow draught vessels. However, this canal will not reach its maximum efficiency until it has a depth of 25 feet m.l.w. There have been no notable additions to its waterfront in the past year, but the terminal facilities show some improvement. Some of its channels have been dredged to good advantage.

Baltimore.—The shipping, both incoming and outgoing, domestic and foreign, from Baltimore, is reported by the authorities as showing a distinct gain, but the rates as fixed by the I. C. C. do not seem to meet general approval. However, the trade to and from western points seems to flow in in a steady stream and the many steamship lines report their vessels sailing and arriving well loaded. A number of improvements in warehousing and terminal facilities have been noted, lessening the cost of dock handling of freight. Other notable improvements include deepening of parts of the harbor by dredging.

The Hampton Roads district, which includes Norfolk and other points at the mouth of the Chesapeake Bay, has been making a strong bid for marine commerce, and has shown a remarkable development with new piers and added railroad terminals. This is one of the most favorably located harbors on the eastern coast. There is no question as to its

ultimate growth which will depend mainly on added railroad facilities to the West.

Charleston is by far the most progressive port on the east coast of the United States south of the Chesapeake capes. Its port management has secured much new traffic, both foreign and coastal and incoming as well as export. The natural facilities of this harbor as well as its geographical position, and the increasing rail facilities to interior points have greatly aided in its development. The depth of water in its channels has been increased to accommodate vessels of any size, and the freight rates have been placed at such figures as to be attractive to shippers. Stevedoring costs have likewise been reduced to a minimum.

Savannah.—Remarkable strides are noted for Savannah, Ga., which the Board of Trade anticipates will take a place among the leading ports of the southeast. The total annual water-borne commerce has had a value lately of over $500,000,000 as compared with $158,495,188 in 1901. Considerable harbor expansion is in progress there.

FLORIDA AND GULF PORTS

Bay Mabel, Florida, was connected with the sea this year, in an initial effort to attract industries to the waterfront and to meet the anticipated needs of the farmers of the Everglades, who are expected at no distant date to be harvesting increasing crops of perishable fruits and vegetables for export and for coastwise shipping. The value of Bay Mabel as a port, however, is yet to be demonstrated.

Tampa and Pensacola.—Except for disturbances caused by the tropical storms of the past two years, Tampa and Pensacola, Fla., have been making progress. In Pensacola, terminal equipment destroyed in 1926 by the storm was replaced and in operation in 1928, and the harbor maintenance engineers have been preparing to make the harbor available for ships of still deeper draught. Tampa entered upon an active year the first six months, during which time 2705 ships entered and cleared the harbor of which only 51 were foreign. The total value of the cargo passing through for the first half of 1928 was $157,055,055. Early in 1929 regular sailings of refrigerator boats to Savannah, Charleston, Norfolk, New York and Boston were contemplated by owners of a new terminal and cold storage plant just put in operation.

New Orleans.—The number of ship arrivals as well as departures continued to increase this year. The Inner-Harbor Navigation Canal is now being used by nearly 1000 vessels of all classes each month. An important development of the past year was the importing of several tons of frozen beef from Buenos Aires as an experiment. This may be the start of an extensive business of this class. At the close of the fiscal year ended August 31, 1928, the thirty-second annual report shows a surplus of $6,216,482.22 above reserves. The tonnage handled was 4,983,770. Grain led, and aluminum ore and other bulk commodities and general merchandise followed.

Mobile.—Few ports can show a more marked development of waterfront freight handling facilities than Mobile, Ala. Its development through a state dock commission having power to spend $10,000,000 will place it in the front rank of American ports. At the rate the value of its commerce has been growing the total for 1928 will be likely to nearly double the value of five years ago, when it was $91,807,114. The past year has seen the dedication of three new piers of modern design on Mobile River. Ample areas have been set aside for future developments for years to come.

PACIFIC PORTS

Astoria, Oregon, reports a complete recovery from the effects of the 1922 fire disaster, as indicated at the opening of 1928 when the announcement was made that a second bond issue had been sold at above par, although the interest on the second issue was a full one per cent below that of the first, which had been sold prior to the fire at substantially

par. The financial position of the port of Astoria has been strengthened by a policy of annual retirement of the bonded indebtedness and its facilities are reported to be expanding as a result of earnings sufficient also to promote added improvements.

San Francisco.—While maintaining its leadership as the center of general import and export trade on the Pacific coast, San Francisco has been surpassed in tonnage by Los Angeles because of the large oil shipments of the latter port and by Seattle, Wash., in value of foreign trade, because of the large imports of silk. In a trade sense San Francisco resembles New York. From a transportation and commercial viewpoint, unless the adjoining ports of Oakland, Berkeley, Richmond, and the communities and industries on Suisun Bay and Carquinez Strait be included, San Francisco is only part of a port. Include these adjoining localities and the shipping center of San Francisco, like that of New York, and its tributaries, will outstrip in tonnage that of any seaboard center in the United States except New York.

Oakland and Alameda.—The progress of Oakland, and Alameda, which also is a San Francisco Bay port, have been worthy of note lately. The ocean trade of both has expanded from comparatively few articles to include a diversified foreign, coastwise and intercoastal business.

Other California Ports.—Among new port developments noted the past year on the Pacific Coast are: Stockton, Calif., which at the beginning of the year announced its ambition to handle 1,000,000 tons of freight during the first year after completion, with docking facilities for 97% of all ocean-going vessels: Newport Harbor, Orange County, Calif., 20 miles east of Long Beach, which is operating chiefly as a fish shipping center. It also has attracted several boat-building companies. Shells are dredged from the harbor here and shipped inland for fertilizer. Dredging to accommodate vessels of deeper draught was planned the past year.

WATER SUPPLY

By H. Burdett Cleveland

Consulting Sanitary Engineer, New York

FINANCIAL ORGANIZATION

The outstanding activity in the public water supply field during 1928 was, again, the acquisition by holding companies of a large number of systems and groups of systems. Eight such holding companies are operating, four of these having been formed within the past three years. This movement is confined to the smaller municipalities, in general, and has no effect on the relative proportion of publicly owned and privately owned supplies since practically all systems taken over have been privately owned.

SERVICE

Revised Manual.—At sectional meetings throughout the country, the American Water Works Association arranged discussions during the year to facilitate a revision of *Water Works Practice*, a manual first issued by the Association in 1925. This manual presents standard practice in nearly all branches of water supply engineering, covering design, construction and management.

Reforestation of watersheds, furnishing public water supplies has continued. In one state alone, New York, the total acreage reached in 1928 was over 20,000.

Guards Against Pollution.—Notable advance in recognition of the principle that polluted industrial and fire supplies should not be cross-connected to potable water supply systems was made during the year. A provision of the Sanitary Code enacted by the Public Health Council of New York State prohibits such cross-connections

after January 1, 1929, unless the municipal supply is protected by automatic chlorinators continuously operated, and by double check valves. On September 18, 1928, the New Jersey State Department of Health added a section to the state sanitary code prohibiting such cross-connections from polluted supplies after April 1, 1929, except under strict regulations.

Pipes.—With reference to the increasing use of copper and brass service pipes, 26 cities reported the use of copper services at the Superintendents' Round Table at the Annual Convention of the American Water Works Association and each such report stated that its use was very satisfactory while 38 cities reported no experience.

Design and Construction.—Considerable study has been given by committees to various general problems of water supply design and construction, especially to industrial wastes in relation to water supply, to standard forms of contract, and to detailed construction features.

Interstate river compacts have attracted considerable attention because of source requirements on the one hand and increasing pollution on the other.

CONSTRUCTION

Aqueduct Contract in New York.—The year has been marked by many large water supply projects under construction or being planned. The largest single contract ever awarded by the City of New York for any public work, approximating $45,000,000, was let for the construction of a seventeen-foot tunnel twenty miles long to serve as a second pressure aqueduct to convey water from Hill View reservoir in Yonkers to Brooklyn. It is expected that the tunnel will be completed in about six years, and that, eventually, it will be extended to Staten Island, at an additional cost of $19,000,000.

The Hetch Hetchy Aqueduct.—Seventeen miles of this aqueduct, practically all tunnel, are nearly completed. This aqueduct will have a total length of 156 miles from the O'Shaughnessy Dam in the Yosemite National Park to the San Francisco distributing system. On May 1st, San Francisco voted $65,000,000 in bonds, $24,000,000 to complete the aqueduct and $41,000,000 to purchase private distribution systems.

Mokelumne System.—Nine municipalities in California, including Oakland and Berkeley, on the eastern side of San Francisco Bay opposite San Francisco, have united to form the East Bay Municipal Utility District and are constructing what is known as the Mokelumne project at a total cost, including the construction and acquisition of local distributing systems, of $65,000,000.

Municipal Projects.—Extensive developments to obtain additional supply for New Haven are being carried out by the water company. Studies are being made for additional water supply facilities at Milwaukee and as to the possible future need of a filtration plant to treat the supply which is derived from Lake Michigan. At Springfield, Mass., an additional pipe line from Provin Mountain reservoir across the Connecticut river to the city is nearly completed. Considerable progress has been made on the $65,000,000 Swift and Ware rivers project of the Boston Metropolitan district. A new intake source along the Missouri River to furnish additional supply for St. Louis is being completed.

WATER SUPPLY TREATMENT

Chicago Plant.—One of the most important water supply treatment experimental projects yet undertaken has been placed in operation during the past year at Chicago, where a $150,000 experimental plant has been constructed as a complete plant, equipped to facilitate extensive studies to determine the most efficient and most economical method of purifying the entire supply for the city. The supply, drawn from Lake Michigan and treated, at present, by chlorination alone, averages 875,000,000 gallons daily.

In view of the intensive study which has been given, recently, at many filtration plants throughout the

country to improvements in processes, to changes in the use of chemical reagents, and to details of filter design and operation, it is to be expected that research work at the Chicago experimental plant will produce authoritative results, will consolidate the gains in methods lately made or indicated, and, so far as such results may be generally applicable, will be of widespread benefit to a degree more marked than has resulted from any similar work since the experiments at Louisville, Cincinnati, Washington, and New Orleans of 1895 to 1901.

Experimental work has been continued during the year with regard to aeration for the removal of tastes and odors and for reduction of the corrosive agent, CO_2; for the discovery and proving of coagulants to be used alone or in connection with alum; for prevention of corrosion by saturation of the water with calcium carbonate and by preliminary dosage with soda ash; as to the benefits of returned sludge in water softening processes; and along many other lines. Much of this experimental work is being done to improve the physical characteristics of water, a requirement of real importance although secondary in value to the insurance of purity.

Chlorination developments have consisted principally in the increased number of instances where chlorine is being applied to the raw water before filtration; in the wider use of chlorine to reduce algæ growths and to correct phenol tastes through super-chlorination and subsequent dechlorination; and in experiments in pre-chlorination to effect economies in the use of coagulants.

Filter Improvements.—Filter design and operating improvements have been principally embodied in the growing adoption of mechanically cleaned sedimentation basins and in refinements in chemical mixing facilities.

Decrease in Typhoid.—Records of typhoid fever reduction during 1928 were not, of course, available at the end of the year, but during 1927, for 50 weeks, total cases in 36 states were 22,400 as compared to 25,500 in 1926 and 30,700 in 1925, according to the U. S. Public Health Service. Typhoid fever deaths have been reduced in about the same proportion. For 74 cities reporting for 1910 as well as 1927, representing a population of 22,300,000 in 1910 and 32,500,000 in 1927, the death rate per 100,000 declined from 20.59 in 1910 to 1.96 in 1927. Water supply filtration and chlorination has been largely responsible for this reduction and for the continued suppression of high mortality from this disease.

ELECTRIC LIGHTING AND POWER

By G. F. Wittig

Statistical Editor, *Electrical World*

GENERAL PROGRESS

Since its beginning the electric light and power industry in the United States has been marked by two characteristics, in as far as its energy output is concerned: a decided annual increase amounting to a doubling every five or six years, the output each year having been greater than in the preceding one with the single exception of 1921; and a regular seasonal swing moderately downward in the spring and more markedly upward in the fall and winter. In that respect 1928 was virtually normal. The rise during the last few months of 1927 and the beginning of 1928 was slightly moderated in consequence of the retardation of manufacturing activity, but the deficiency was balanced by the subsequent growth, in turn reflecting the improvement in industrial conditions. In a general way the revenue and operat-

ing expenses plus maintenance follow the same cycle, except that the annual increase is somewhat smaller. This was notably true in the case of the expenses, economy of operation being secured in part, at any rate, by increased investments in physical plant.

The changes are shown in greater detail in the following figures taken from the *Electrical World:*

ANNUAL OPERATIONS

	1927	1928 (Partly estimated)
Energy generated, kw.-hr.	75,781,000,000	83,110,000,000
Gross Revenue	$1,769,300,000	$1,908,000,000
Operating Expenses and Maintenance (not including taxes and amortization)	$761,650,000	$791,600,000

MONTHLY OPERATIONS AND INCREASE OVER PREVIOUS YEAR

Month	Output Millions of Kw.-hr.	Incr. %	Revenue, Thousands of Dollars	Incr. %	Oper. Exp. and Maint. Thousands of Dollars	Incr. %
1927						
November	6,518	7.5	158,200	6.7	64,300	2.9
December	6,811	6.8	165,100	6.5	67,900	6.9
1928						
January	6,768	7.4	171,700	6.6	66,700	2.9
February	6,403	12.2	162,300	7.4	64,200	4.9
March	6,768	7.2	157,300	8.3	64,700	3.2
April	6,425	6.2	153,800	6.0	64,100	2.6
May	6,722	8.1	150,300	7.6	65,700	3.8
June	6,638	8.3	149,500	8.2	64,800	3.2
July	6,762	10.7	146,600	9.2	64,100	2.9
August	7,123	12.4	148,200	9.3	66,400	3.4
September	6,915	11.1	156,100	8.1	64,500	5.2
October	7,527	14.4	164,000	8.8	67,400	4.5

In addition a relatively small amount of energy was imported from Canada, as in previous years, amounting in 1927 to 1,632,000,000 kw.-hr. and to about 1,580,000,000 kw.-hr. in 1928.

The estimated allocation of the energy is, in millions of kw.-hr.:

Use	1927	1928
Industrial Power	41,185	46,100
Lighting	16,300	17,000
Sold to Railways	6,108	6,600
Losses and Intra-company use	13,820	15,000

RECORD OF PURCHASED ENERGY

Subtractions.—A certain duplication in the financial statistics is caused by the cost of purchased energy, which appears as revenue for the selling company and expense for the one buying it. Broadly speaking, these wholesale movements of energy occur at periods when a company has excess capacity available in its plants, because of abundance of water power, and moderate loads or other conditions which enable it to sell at a lower cost than the neighboring company can generate. This accounted for about $110,000,000 in 1927. The amount in 1928 will be approximately the same. The revenue from sales to ultimate consumers is, therefore, less than the total revenues by corresponding amounts.

Capital.—In addition to the regular expenses of operation and maintenance, there is required each year a large sum of additional capital for new construction. The amount for 1928 will probably prove to have been about three-quarters of a billion dollars. It was somewhat larger in 1927.

Total Output.—Of the output in 1927, 29,461,000,000 kw.-hr., or about 39 per cent, came from water power.

In 1928, the amount in every month was markedly greater than that of the corresponding month of 1927, so that the total for the year will probably exceed 34,000,000 kw.-hr. Because of the natural distribution of available sites and because the distance over which energy can be economically transmitted is limited, water power is of major importance only in the Southeast and Far West. The other sections of the country, including the populous industrial areas, are forced to rely chiefly on fuel, hydro-electric energy constituting for them only a supplementary supply; moreover, its economic feasibility threatens to be gradually restricted by the increasingly efficient use of fuel in great base-load plants and by the much larger investment required for constructing hydro-electric plants, usually with a further handicap of long and costly transmission lines to the load centers.

STATUS OF THE INDUSTRY

The status of the industry, at the beginning of 1928, is statistically indicated in the following tabulation:

Capitalization	$9,500,000,000
Installed generating capacity	25,420,000 kw.
Number of Customers	22,119,200
Residential	17,954,900
Commercial Lighting	3,220,900
Power and Miscellaneous	943,410

Growth during the year will bring the capitalization above $10,000,000,000; incomplete data, as this article is written, indicate an increase of somewhat more than 2,000,000 kw. in generating plants and approximately 1,250,000 additional customers during 1928, of whom 1,050,000 are residential. The total of the latter, as of December 31, 1928, is slightly over 19,000,000, according to the most accurate available data.

The trend toward concentration and large-scale operation continues. A tabulation of systems having an output of 100,000,000 kw.-hr. or more during 1927 shows 124; of these 21 exceeded 1,000,000,000 kw.-hr. Measured by this criterion, the two largest systems are those of the Buffalo, Niagara and Eastern Power Corporation, with an output (generated and purchased) of 4,634,341,084 kw.-hr., and the Commonwealth Edison Company of Chicago with 3,778,380,000 kw.-hr. The plant capacity of the fromer is 730,000 kw.; that of the latter is 1,004,500 kw.

CONGRESSIONAL ACTION

Walsh Resolution.—Shortly before the beginning of the year, Senator Walsh, of Montana; offered a resolution in the United States Senate calling for the appointment of a special committee of five Senators to conduct an investigation of electric and gas industries. The substance of that resolution was given in the YEAR BOOK for 1927. In a series of hearings before the Interstate Commerce Committee of the Senate the resolution was vigorously opposed by representatives of state utility commissions on the grounds that the utilities are subject to the plenary power of the states, which is being exercised effectively, and that, further, only a small percentage of the energy generated by public utility companies crosses state lines and these cases can be handled by joint action of the commission of the states involved. In that connection, a committee representing the National Association of Railroad and Utility Commissioners submitted a report to the committee containing these statements:

"On behalf of such Commissions they challenge the statement made by Senator Walsh . . . in which he made suggestions regarding the proper functioning of State Commissions, and at the same time disclaiming knowledge of any facts justifying such belief. They believe that any investigations fairly conducted will not fail to justify the work that has been done by the State Commissions and vindicate the purpose of state regulation. The Commissions declare themselves opposed to invasion by the Federal Government in any manner of the right of the sovereign states of the control and the regulation of such utilities. Therefore, these Commissions are opposed to any action of Congress that might result in an invasion

of state rights or the substitution of national for state utility control."

INVESTIGATION

The Statute.—An amendment to have the investigation conducted by the Federal Trade Commission was lost in committee, but was included in the bill as finally adopted by the Senate on February 15, which also involved other changes from the original resolution, the most important being that it was made to apply to public utility corporations doing an interstate or international business. Substantially, as in the original resolution, the Commission was empowered to investigate attempts to influence public opinion or to influence or control elections of President, Vice-President and members of the United States Senate.

"The Commission is hereby further directed to report particularly whether any of the practices heretofore in this resolution stated tend to create a monopoly or constitute violation of the Federal anti-trust laws."

Hearings.—The hearings continued through the spring and into the summer, and were resumed in September. Numerous witnesses were examined and voluminous testimony was taken. It was shown that the state information bureaus of the power companies, though the funds at their disposal are small, have coöperated systematically and have built up an efficient organization to inform the public of the views and activities of the utility industry. The channels of public appeal have included newspaper advertising, press releases, pamphlets for school use, employment of speakers, including university teachers, before sundry organizations and bodies, the payment of expenses incurred by members of the faculties of agricultural colleges in attending joint meetings for encouraging the use of electricity in agriculture, and various forms of cooperation, usually through departments of economics, in connection with university courses relating to public utilities.

Arguments.—On behalf of the utilities it was stated that many of the textbooks dealing with public utility matters contained expressions of opinion hostile to the private conduct of the business, or dealt with it inadequately, or contained glaring errors, or omitted such fundamental facts as the existence of regulatory statutes. "In a large measure it has been necessary to offset the activities of professional advocates of the nationalization of industry, whose program usually has been to begin with the public utilities, and of proponents of a perhaps milder but quite as devastating innovation, the deliberate setting up of what is certain to be unfair governmental competition with existing utility service. These influences have had no hesitation in extending their activities to the schools and colleges."

Questionnaire.—Early in the fall, a 225-page questionnaire was sent to the electrical and gas utilities by the Commission, calling for detailed replies classified under 78 schedules, relating to operations during each of the past ten years. The time required first for compiling and furnishing this mass of data, and then for digesting it, apparently makes the final report of the committee a matter of the somewhat distant future.

COLORADO RIVER DAM

Investigation.—After almost continuous discussion in committee, in the press, by engineering and business organizations and on the floor of Congress the Swing-Johnson bill was passed by the House on May 24 last but failed of passage during the closing days of the session in the Senate. A joint resolution was, however, passed and signed by the President calling for further engineering investigation of the project. Under its terms the Secretary of the Interior appointed a Commission, headed by Major General W. G. Sibert.

Report.—In its report, submitted to Congress at the opening of the short session, the Commission estimated the cost at $165,000,000, or from $25,000,000 to $40,000,000 more than previous estimates; expressed the opinion that the plan was feasible from an

engineering standpoint but that Black Canyon, twenty miles down stream from Boulder Canyon, offered a more advantageous site than the latter; and pointed out the need of conservative if not ultra-conservative construction because of the immensely disastrous consequences that would result from the failure of the dam.

The project includes three features: (a) a dam in the Colorado at Black Canyon, not far from Las Vegas, Nev., or at Boulder Canyon, creating a storage reservoir with a capacity of 26,000,000 acre-feet; (b) a power-house with 1,000,000 hp. of installed capacity; (c) an all-American irrigation canal, located just north of the Mexican boundary and leading to the Imperial Valley in California.

Discussion.—Debate on the proposal involved two opposite and inherently antagonistic views with reference to the proper sphere of the government's activity. To summarize them without apparent bias towards one or the other and without quoting at length is difficult. The salient features of the arguments by the advocates and by the opponents appear to be these:

ARGUMENTS

Construction.—Because of the torrential floods of the river caused by melting snows in the mountains, and because of the gradual silting of the bed of the lower part of the stream, the fertile Imperial Valley is increasingly threatened with inundation, for which flood control affords the only prevention. To this the reply is made that the floods of the Gila remain a hazard even if the Colorado is controlled and that the latter purpose can be accomplished more cheaply by other works. The propriety of some sort of governmental action does not appear to be disputed.

Power.—Construction of a high dam at one of the proposed canyon sites would afford a source of future water supply to the growing population of southern California. This would require an aqueduct of some 200 miles, and the lifting of the water to a height of 1500 feet over the Coast Range. The power for the necessary pumping would come from the proposed electric plant. The criticism offered against that portion of the plan is that it requires the nation to pay for developing a local water supply, available otherwise at lower cost, and that the construction of a dam 700 feet from foundation to crest, higher than any yet built, in a narrow canyon subject to rushing floods more than 100 feet deep, involves hazards and difficulties of which the cost can scarcely be anticipated.

Expense.—The cost, it is contended on the other hand, would be defrayed by the sale of surplus energy. This feature is urged by the advocates of governmental development and operation of power sites. The opponents urge; first, the objections to the bureaucratic conducting of activities that can be satisfactorily performed under private initiative; second, the impropriety of competition by the government with its citizens in business, assuming that energy can actually be delivered more cheaply at the point of consumption than by private companies now serving southern California; and third, that the cost of energy at the end of a 250-mile transmission line, to cover the annual charges on the venture, would really be likely to exceed that at which it can be generated locally in fuel-burning stations, which are constantly increasing in efficiency, and in view of previous experience on the difference between preliminary estimates and actual final costs.

Result.—The bill passed the Senate December 14, was concurred in by the House on the 18th and signed by the President two days later. The satisfactory allocation of the water and of the electrical energy to be developed is still a matter of dispute between the seven states containing the Colorado basin.

MUSCLE SHOALS

Norris Resolution.—By a vote of 48 to 25, the Senate on Tuesday, March 13, after a debate lasting three weeks, adopted the Norris joint resolution providing for Federal operation of the government's plant at

Muscle Shoals. Under the resolution, the money derived from the sale of electric power will be used for experimentation in the manufacture of fertilizers. Whether or not the failure of the President to sign it constituted a "pocket veto" has been debated. The question will be settled by the decision on another case now before the United States Supreme Court.

POWER *VS.* GENERAL

U. S. Chamber of Commerce Committee.—In order to gather advice preliminary to a definite and constructive stand on modern power problems, the Chamber of Commerce of the United States has set up a National Water Power Policies Committee, that convened in Washington on November 12th. On the committee, which has been selected to include outstanding men from all branches of business directly concerned, as well as engineers, there are representatives of financial, railroad, farming equipment, fertilizer and other interests.

Issues.—The discussion related to those features of hydro-electric power development with which the Committee might now constructively deal. These include government *versus* private ownership and operation, Federal and state functions as to jurisdiction and regulation; relation of hydro-electric power to other water uses and to fuel-electric power; a proper measure of water power resources and practicability of development; and present national policies as laid down in the Federal Water Power Act. Attention was also given to those features of water power development which have resulted in efforts to obtain special legislation for such projects as Muscle Shoals and Boulder Dam, resulting in the withdrawal of great watersheds like those of the Tennessee and Colorado Rivers from active development.

Rates.—From time to time during the year reductions in rates for residential service were announced by various companies. The trend has been in the direction of a more logical allocation of charges, partly by cheapening the cost of lighting but particularly by reducing the rate on energy used for domestic appliances. A few instances will illustrate the tendency.

In New Bedford, Mass., after a protracted strike in the textile industry, a rate was announced to take effect December 1st which puts most of the energy used in excess of the fundamental lighting load on a 2½ cent rate.

In St. Paul and Minneapolis, Minnesota, a new residential rate was established putting most of the excess over the ordinary lighting load on a basis of three cents per kilowatt hour, while in Alabama a new rate filed before the Public Service Commission would put the excess on a three cent and, in still larger amounts, a two cent basis.

A question regarding the authority of a State Public Service Commission arose in the case before the Indiana Supreme Court in which the City of Logansport appealed from a rate schedule on electric current fixed by the Commission. The municipality claimed that its inherent right on local self-government had been invaded; the Attorney General, representing the Commission, declared that no question of local self-government was involved.

On October 24th hearings were opened in the case of the Cambridge Electric Light Company *versus* the Massachusetts Department of Public Utilities. The company seeks an order restraining the Commission from enforcing its finding of last January by which it reduced the company's maximum lighting rate from eight cents per kilowatt hour to five and a half cents.

CONSOLIDATIONS

With the growth of physical interconnections between adjacent companies and the operating economies flowing from the practice of serving large areas from a few large and efficient stations, rather than from a multitude of smaller ones, and the possibilities of financing major projects in construction by large aggregations of capital, the trend toward consolidation of properties has con-

tinued. A prominent case was the consolidation, effected late in the year, of the Brooklyn Edison Company with the Consolidated Gas Company of New York.

This action combines the several electrical utility companies supplying energy to virtually all of New York City (except the Borough of Richmond) with nearly 2,000,000 customers, a combined investment of approximately $1,000,000,000 and 1,400,000 kw. of generating capacity. Taken as a whole, the new organization will be the largest electrical service organization in the country.

NEW POWER INSTALLATIONS

Notable individual increases in steam plants were the putting into operation of a new unit of 130,000-kw. in Brooklyn and the installation of two units of 165,000-kw. each, virtually ready for operation at the close of the year, in New York. Both were additions to existing stations. Other new installations, some of them approaching these in magnitude, were put into operation in various parts of the country.

In Hartford, Conn., a 10,000-kw. turbine driven by mercury vapor was put into regular service in October. The new unit involves an innovation that may have important economic consequences in the development of energy from fuel. Used together with the existing 40,000-kw. of steam-driven turbines, the combination has resulted in a material reduction of coal consumption per unit of electrical output.

Increasing efficiency on a nation-wide scale is shown in a further reduction of the fuel consumption from an average of 1.84 lbs. of coal per kilowatt hour in 1927, to 1.76 lb. in 1928. In 1919, it was 3.2 lbs. It has thus been almost cut in half in nine years. The conservation of the national fuel supply represented by this reduction is equivalent to a saving well in excess of 30,000,000 tons of coal in 1928 alone.

CONOWINGO PLANT

A hydro-electric plant that is now the second largest in the United States, with an installation of seven 54,000-hp. units, went into operation early in 1928 at Conowingo, on the Susquehanna River in Maryland, 6 miles south of the Pennsylvania line. When completed with an ultimate installation of eleven such units, comprising an aggregate of 594,000-hp., it will exceed in rating any other hydro-electric plant in the country, and the annual output will be equivalent to that produced from 750,000 tons of coal.

Initially, the energy will be delivered to the Philadelphia territory, there to be used in conjunction with the output from the existing steam-electric system, by means of a 220,000-volt transmission line 57.7 miles long. In a broader sense, however, it will constitute an important element in a proposed inter-connected system serving the greater part of eastern Pennsylvania and the state of New Jersey, and consisting of the systems of the Philadelphia Electric Co., the Pennsylvania Power & Light Co., and the Public Service Electric & Gas Co. of New Jersey. These several systems are to be connected by 220,000-volt transmission lines for the mutual interchange of power in large quantities in such a way as to minimize investment and operating costs to each of the companies.

RAILROAD ELECTRIFICATION

Railroad electrification is of interest in connection with the electric light and power industry because of the trend toward the practice of purchasing energy for railway operation from public service power plants. Definite action was taken, during the latter part of the year, on several projects of major importance.

During the fall, announcement was made of the intention of the Pennsylvania Railroad to electrify its main lines from New York City to Wilmington, Del. Arrangements are reported to have been made by the railroad to purchase quantities of power from the Public Service Corporation of New Jersey and the Philadelphia Electric Company. This is apparently at present the most extensive electrification program in the United

States, involving both passenger and freight service on 325 miles of line and 1,300 miles of track, with an expenditure of $100,000,000 within the next seven or eight years.

Coming electrification of the major portion of the Reading Railroad in the metropolitan area of Philadelphia, with probably ultimate extensions to New York, Bethlehem and to the Schuylkill Valley territory, was announced in November. Electrification of the Lackawanna system in eastern New Jersey is definitely planned, and construction is to begin early in the spring of 1929.

COGNATE SOCIETIES

AMERICAN WATER WORKS ASSOCIATION.—29 W. 39th St., New York, N. Y.

INTERNATIONAL ASSOCIATION OF FIRE CHIEFS.—Fire Headquarters, Race St., Philadelphia, Pa.

NATIONAL PARKS ASSOCIATION.—1512 H. St., N. W., Washington, D. C.

NATIONAL PUBLIC SERVICE ASSOCIATION.—87 Nassau St., New York, N. Y.

PARKS AND PLAYGROUNDS ASSOCIATION OF NEW YORK.—1123 Broadway, New York, N. Y.

DIVISION IX

DEFENSE AND ARMAMENTS

MILITARY PROBLEMS OF THE UNITED STATES

By William Addleman Ganoe

Major, U. S. A.; Historical Section, Army War College

WAR DEPARTMENT AND ARMY ACTIVITIES

The War Department and the Army of the United States cover a wide field of varied activities. Besides the main problem of proper defense for the country, the officers of the military establishment are charged with the supervision of Rivers and Harbors, Flood Control, Inland Waterways, Panama Canal and Insular Affairs.

In the island possessions the work of the War Department and the Army has been progressive, although much misunderstanding of the real conditions existing in Porto Rico and the Philippines has been caused by those who are without detailed and accurate information on the subject. Foreign countries have been influenced by statements discrediting the United States. The reflection of such propaganda in Porto Rico, especially upon the immature and thoughtless, has impeded certain forward movements of the Island. The facts and figures that will be disclosed later in this volume should prove the groundlessness of any such attacks. In the Philippines the main problem of the War Department has been to obtain an interest on the part of outside capital in investment in this new and distant field. Efforts are being successfully made toward the removal of the discouraging influence upon the influx of necessary funds for substantial upbuilding. The Governor General of these islands has, mainly with this in view, recommended the revision of the corporation law, public utilities law, and the land law.

Mississippi Flood Control.—In our own country, the problem of the Mississippi flood control has been an intricate one for the Corps of Engineers. Certain engineering differences between the adopted project and the plan recommended by the Mississippi River Commission are, under Act of Congress, to be adjusted by a board consisting of the chief of Engineers, the president of the Mississippi River Commission and a civil engineer appointed from civil life by the President. While the board has been actively engaged in this adjustment, the work of repairing levees and closing crevasses caused by the 1927 disaster was pushed with all possible speed by army engineers.

Engineering Work.—While this corps has been so employed, it has also overseen the work of rivers and harbors, inland waterways, and the advancement of engineer works in the District of Columbia. Against such procedure for forty years, with varied intensity, pressure exterior to the War Department, has been made to secure legislation transferring such supervision and direction from War Department control and, consequently, from the corps of engineers. It has been necessary to combat such a change in the interest of economy and military engineering preparedness. In many quarters it is not understood that officers of the army, working without political affiliation, can produce a peculiar efficiency and economy

and a fine contribution to National Defence.

The Air Corps has been considerably handicapped with the presence of a large wartime stock of liberty engines. In using them to the best advantage in carrying out the policy of strictest economy, it has not always been possible to obtain a better type of engine. The matter of absorbing the old ones, without seriously hindering the progress of flying, has been a difficult one.

Weapon and Munition Developments.—In other branches of the service, those material needs essential to any possible participation in war, have been foreseen by the development and improvement, in time of peace, of types of weapons and other munitions. Much of such work must logically be a forecast, principally because of the consideration that the latest development today may be out of date tomorrow. For that reason there has been a continuous effort to assure a proper availability of emergency production by a setup of the latest types. For this purpose the War Department has been steadily energetic in having on hand for such types the proper jigs, gauges and dies, so that when the munitions may become necessary there should exist the proper means of producing them.

PROBLEM OF WAR SUPPLIES

Raw Materials.—Allied with this problem is that of producing in time of war those raw materials wherein domestic production falls short. If, in an emergency, these strategic materials are not forthcoming, privation to the country must follow. In order to alleviate or repair such a condition, constant studies of our domestic resources are being made so as to stimulate production in time of emergency, or cause substitutes to be made.

Supply System.—The World War brought a realization of immense and involved difficulties in the procurement of supplies for a nation at arms, but left no perfect model as a guide to future planning. In these *post-bellum* years it has been necessary to build from the beginning a system and method of procedure for procurement. However much progress has been made, there still remain many problems to be solved. The most difficult are those connected with organizations and with the delimitation of duties and responsibilities of the several agencies concerned with such procurement. Agitation in the Department for a special defense or general mobilization plan would give a more specific basis for this work. Even so, many assumptions would have to be made. It has, therefore, been found that one general mobilization plan is about as good as another, and for this reason the plans of 1924 and 1927 are used as a basis for computation.

War Reserve Requirements.—This development goes hand in hand with the matter of war reserve stocks. Although ten years have passed since the war, little real progress has been made toward placing them on a sound basis. Requirements are still in a state of flux, surpluses and deficits are largely a matter of conjecture or opinion, and recognition of the problem by the estimating and appropriating authorities is mainly confined to a few ammunition items. The preparation, therefore, of a specific defence plan, which will forecast with nicety the effort required adequately to defend the nation from invasion during the period of industrial transportation, is one of great need now confronting the army. With executive approval of such a plan and legislative sympathy in such a direction, it would be possible for the first time to submit for the attention of Congress a definite program for peacetime accumulation and maintenance of essential stocks.

ARMY PERSONNEL

Housing Problem.—Coming to the personnel of the army itself, Congress has approved a housing program and has appropriated money therefor. Though the progress upon habitable quarters has been satisfactory, it has necessarily been partial and gradual because of the long period over which the funds for adequate shelter have been made available. Meanwhile, it

has been necessary to order a considerable number of troops to permanent garrisons from those camps lacking in suitable quarters. Such moves caused the dispersion of organizations with the consequent handicap to training effectiveness. The appropriation covers the housing of only 28,455 enlisted men and 1196 officers. Provision remains to be made for 17,065 enlisted men and 3286 officers. On June 30, 1924, over 40,000 members of the permanent establishment were living in tents or in wooden barracks of wartime construction.

Uniforms.—Lack of suitable uniforms for enlisted men, especially for the National Guard, has caused considerable manipulation. It is necessary to set aside a sum each year from Militia Bureau funds in order to have this uniform ready at some future date. Naturally, it should not be issued piecemeal. It is hoped that sufficient funds may be accumulated by the close of the calendar year 1930 to clothe this large component of the Army of the United States in modern uniforms.

Mounts.—Another deficiency in the National Guard is that of suitable mounts for horse-drawn organizations. The total number of horses now on hand is only 10,420. Many of them, through the infirmities of age, are unfitted for heavy use and are maintained at questionable expense in the light of their possible utilitarian value.

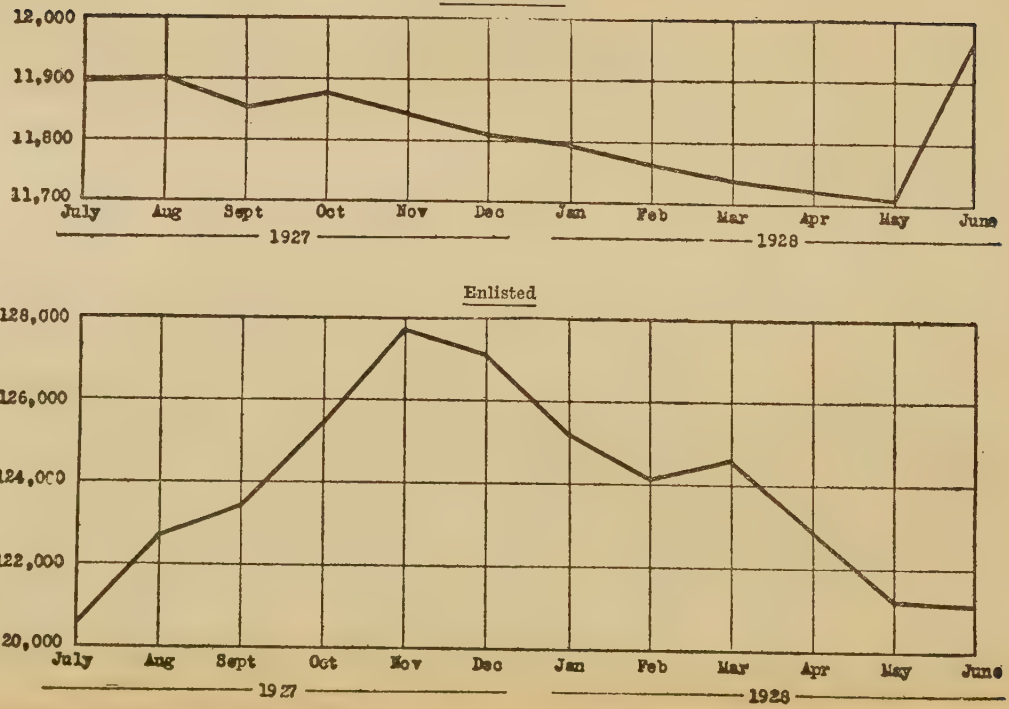
Organized Reserves.—While the Regular Army and the National Guard have a distinct function both in peace and war, the Organized Reserves are not so situated. Theirs is an organization wholly organized and trained for an emergency. The essential peacetime need of the Organized Reserves is, therefore, unit training. The instruction must be of such character as to assure that soon after the outbreak of any possible war, units will be ready for the prompt reception of thousands of citizens who would fill the enlisted ranks. To obtain officers who are willing to undertake active duty service with their own units during peacetime, in order to give proper training to the war unit, is exceedingly difficult. Retention of officers who will not do so retards the development and instruction of organizations. Since our Organized Reserves are unlike those of any other world power and are completely dissimilar to any reserves contemplated in this country prior to the World War, their development along effective lines has involved the solution of great problems for our national security. There is little to guide those in power from past experience. Consequently, the Organized Reserves have not enjoyed the stabilization common to other components of the army. It is hoped that the new regulations in vogue now will place the organized reserves on a secure foundation.

ENLISTMENT AND PROMOTION PROBLEMS

In the Regular Army itself the total enlisted strength has been reduced in order to provide the 1,248 noncommissioned officers and privates who by law should form the first increment of the augmented Air Corps. Similar reductions of the Regular Army, in order to give the necessary quota to the air forces, will be necessary during coming years. The strength of our oversea garrisons cannot be depleted. Further reductions must come from the personnel of branches within the United States. Since the Army's primary mission is continuous preparation for immediate service in the event of any great emergency, strategical points and vital areas must be defended from the moment of the outbreak of the war. The element of time makes improbable recruitment of units to full or partial war strength. The existing establishment must suffice during those crucial hours which must elapse before the National Guard can take its place in the front line of defense. It is a matter of grave concern that the War Department contemplates further reduction in branches which within the United States total but 66,105 soldiers for an area of 3,000,000 square miles, and a population of over 120,000,000 people.

Probably the most pressing and de-

FLUCTUATIONS IN ARMY PERSONNEL
(fiscal year 1928)



pressing problem confronting the service is that of the proper promotion of officers. About 6000 captains and lieutenants came into the service at the close of the war, approximately at the same time. The usual spread of years that operates ordinarily for a steady flow of advancement is largely denied them. The consequence is that there is little hope of many of them reaching the grade of colonel or lieutenant colonel. Their plight has been aggravated all the more by the reduction of the army in 1922. Many, irrespective of their valued and efficient services, have no hope of a proper future. It is only because of their belief that Congress will soon alleviate this condition that many of them remain in the army. A delay in its settlement, on the other hand, will doubtless engender many resignations and a consequent loss of morale in our combatant forces. Probably nowhere in the army are there men more adversely affected by this so-called World War hump than in the Air Corps. Junior officers are performing duty out of proportion to their rank.

The primary purpose of the army is to be in readiness for immediate operation. To accomplish such a result, the Regular Army and National Guard should be immediately available to organize for field service, and the state of their training should be such as to promise success in any probable combat mission. In the World War the average American soldier who participated in a major engagement received eight months of training before he entered a quiet sector. For those who entered combat, the training period averaged ten to eleven months. In future, it will be the exception for our Army to have allies to hold the line while such lengthy training is going on. At present, our divisions are incomplete organizations. Time must elapse before a complete division in a state of adequate preparation for combat can be acquired.

MILITARY EDUCATION

By William Addleman Ganoe

Major, U.S.A., Historical Section, Army War College

THE ARMY SCHOOL SYSTEM

Grades and Courses.—The school system of the Army ranges from the post schools and troop schools, conducted wholly within units or posts, through the special and general service schools to the Army War College. Exclusive of the U. S. Military Academy with its 878 cadets and the many post and troop schools, there are 43 permanent educational institutions throughout the service. The Army War College at Washington finds the culmination of this comprehensive system in an advanced curriculum, covering national and international problems involving military considerations of broad scope for the senior officers of the Army. Leading up to this course are two general and 27 special service schools (see table). Since 1923 the course at the Command and General Staff School has been of one year. The change was made in order to double attendance and thereby permit completion of the course by a greater number of the officers in field grades who had not had opportunity to attend the school. At present there are both one- and two-year courses. (For a list of General and Special Service Schools see The American Year Book, 1927.)

The Army Industrial College has carried on its mission of training Regular Army officers for duties pertaining to the supervision of military supplies and adequate provision for industrial mobilization of the country in a national emergency. The work is confined to instruction in matters of general policy and the broader aspects of procurement activity, both in peace and in war, leaving to each supply branch the work of instructing its officers in the more detailed

and special phases incident to its own activities. In the 1927-28 course at the college, 36 officers were graduated and for the 1928-29 course 40 are enrolled, including officers from the Navy, Marine Corps, and the line of the Army. It is considered essential that officers of the line who are eligible for the General Staff and who desire to take the course be accorded that privilege.

Special Service Schools teach the doctrine and use of material for each branch, so that standardization of methods is spread to all components of the Army of the United States.

From the Army Special and General Service schools have been graduated, in addition to Regular Army, Marine, Naval and foreign officers, 1499 officers and 514 enlisted men of the National Guard, during the past four years.

RESERVE OFFICERS' TRAINING CAMPS

Enrollment.—Units of the Reserve Officers' Training Corps, maintained at 225 educational institutions in every state of the Union, the District of Columbia, Porto Rico, and Hawaii, had an enrollment of 112,349 at the close of the 1927-28 school year. Of this number, 13,128 were students in the advanced course of senior units. 7200 selected members of the advanced course attended summer training camps in 1928, where they were afforded a six weeks' period of instruction, which served successfully to round out the theoretical and practical training received on the college campus. During the four years ended with the school year 1927-28 there graduated from the Reserve Officers' Training Corps, 22,981 college and university students. Of this number 21,217 were tendered commissions in the Officers' Reserve Corps, 20,941 accepting such appointments immediately. Others, disqualified for appointment by reason of age, later received appointments as lieutenants. At an approximate rate of 5000 each year, therefore, we find this important element of our national defense furnishing to the Organized Reserves a group of young officers of high intelligence, well schooled in the fundamentals of the military art. There is infused into the Officers' Reserve Corps new life. Thus are filled the vacancies occurring through the relinquishment of military activities by a continually increasing number of World War veterans which originally comprised the Officers' Reserve Corps.

Citizens' Training Camps.—In the summer of 1928 there were enrolled in the citizens' military training camps 35,660 youths. Fifty-two camps were conducted in 34 states of the Union and in Porto Rico. Applications for admission totaled 57,868, exceeding all records since the establishment of the camps in 1921. Even this considerable number of applications does not afford an accurate indication of the widespread popularity of this system of training. During the four years ended in 1928, applications were received by the corps areas from 221,850 youths, of which number 143,566 were admitted into the camps. During the past four years a growing number of military schools, private schools, and colleges, among the latter many of the leading educational institutions in this country, have awarded scholarships bearing free tuition and other allowances to selected youths of the training camps. In large numbers and with singular unanimity, parents of youths who have completed one or more courses of instruction express gratitude for the advantages offered and approval of the citizens' military training camps as a medium for the development of boys into men physically and mentally competent to assume places in a democratic American citizenry.

INFANTRY SERVICE SCHOOLS

The Infantry School, located at Fort Benning, Ga., and covering almost two counties of that state, conducts 8 courses for the students, the Refresher, Advanced, Company Officers, National Guard and Reserve Officers, National Guard and Reserve Officers' Rifle, National Guard and Reserve Company Officers, National Guard Enlisted Specialists and Horseshoers.

In the Infantry School, the instruction in the technique of weapons has become so perfected and thorough that the time for its application has been materially shortened. The saving has permitted a corresponding increase in the time applied to tactics, especially that part which will train the students to prepare and conduct tactical problems for the instruction of others, and to the subject of mechanization which has, during the past year, been of increasing importance to the army. Additional time is being devoted to systematic physical training, which has been injected into the schedule on days during which the classes are not engaged in outdoor exercises.

The Tank School, under the control of the Chief of Infantry, has in its curriculum a Reserve Officers' and an Enlisted Men's course. The one for enlisted men covers motor mechanics, communications, reconnaissance, stenography and typing, light mechanical, light driving, heavy mechanical, heavy driving, tank gunnery, motor vehicle driving, battery repair and maintenance and clerical.

In the Tank School, approximately 100 additional hours of motor instruction have been added to the course, and the number of regular army officer students has been increased from approximately 24 to 50. These steps are in accord with the increasing tendency to mechanization in war. The additional students were drawn from Infantry regiments. A nucleus of officers will thus be provided throughout the Infantry branch who will be better equipped to keep abreast of the development and progress now taking place in motorization.

Infantry Correspondence Course.—A complete revision of the Infantry correspondence course was made during the year. The notable features of the new course are: the preparation of the special text for each subcourse, whereas before, students necessarily were required to obtain information from a mass of current army and training regulations; simplification of the scope of the courses; improved sequence of subjects, making each course progressive to the next; and the elimination of the final examination.

THE CAVALRY SERVICE

The Cavalry School at Fort Riley, Kan., constitutes the most important agency under the Chief of Cavalry for the instruction of officers and enlisted men in all departments of their profession and provides a workshop for the development of cavalry organization, technique and tactics. Its student body is composed of cavalrymen of the Regular Army, a few officers and enlisted men of other branches of the army, and selected officers and enlisted men of the National Guard and Organized Reserves who pursue an intensive course of instruction.

Instruction for officers is given in the Troop Officers' Course, the Advanced Course, the Advanced Equitation Course, the National Guard and Reserve Troop Officers' Course, the National Guard and Reserve Field Officers' Course, and the Refresher Course. Courses of instruction in horseshoeing and in saddlery were given to 100 non-commissioned officers and selected privates of the Regular Army, National Guard and Reserve. In addition to the above, there is being introduced into the Cavalry School a six months' practical course for selected non-commissioned officers, designed to qualify them as instructors in their organizations and with the civilian components of the Army in all phases of cavalry work. In the conduct of all courses emphasis is placed upon the value of training for campaign rather than for peacetime proficiency. Instruction is practical as well as theoretical and aims toward the development of efficient instructors.

Correspondence Courses.—Supplementing the instruction at Fort Riley, the Cavalry School prepares the Cavalry Correspondence Courses, through the medium of which instruction is being given at present to 1769 individuals of the Regular Army and civilian components. The value of the instruction in horsemanship at the Cavalry School is shown in the successes of the various service teams

participating in horse shows throughout the country.

ARTILLERY

The Field Artillery School serves as an agency of the Chief of Field Artillery in the development and perfection of field artillery technique and tactics and as the dispenser of that knowledge to all components of the Army. Past experience in war has been more thoroughly studied, carefully analyzed, and efficiently applied to present practice than ever before. The applicatory system of instruction has gained a secure footing. Correspondence courses have been improved yearly until they have now reached a point of efficiency where they form an indispensable part of the instructional system. The recent inauguration of a mailing list at the school will prove a decided step toward keeping fresh and improving the practice of the students. The Field Artillery School is probably a greater factor than ever before in the maintenance of the efficiency of the arm. The curriculum embodies Field Officer and Senior Captains', Battery Officers', Advanced Equitation, and Advanced Motor courses. Enlisted men of the Regular Army, National Guard and Reserve Corps are given horseshoers, saddlers, motor mechanics, communications, and battery mechanics courses.

The Coast Artillery School, the oldest of the special service schools, celebrated its centenary in 1923. The principal course is the Battery Officers' Course, attended by captains and lieutenants; it is concerned chiefly with artillery technique. For older officers, the Advanced Course provides study of tactical employment. An advanced course in motor transportation was added to the curriculum during the year to meet the growth of mechanization.

ENGINEERING AND SIGNALING

The Engineer School completed in 1928 a rigid curriculum in engineering and military subjects. Both officers and enlisted men of the Regular Army passed satisfactorily the courses assigned, the enlisted men covering the subjects of drafting, surveying, map reproduction and photography. National Guard and Reserve Officers completed special courses in 1928 and were awarded diplomas. Supplementary to the work at schools within the service, engineer officers broadened the scope of their education by pursuing work in outstanding colleges and universities. In 1928, 12 engineer officers received *in cursu* the degree of Bachelor of Science in Civil Engineering from Cornell University, 2 the same degree from Massachusetts Institute of Technology, 6 the degree of Master of Science in Civil Engineering from the University of California, and one the degree of Master of Arts from Princeton University. Two engineer officers, who have been attending Oxford University as Rhodes Scholars for three years, completed successfully their courses in 1928.

The Signal School graduated forty-eight officers from the Company Officers' Course. Of these, eighteen were from the Signal Corps; twenty from the Infantry; five from the Cavalry; two from the Field Artillery; one from the Coast Artillery Corps; and two from the Marine Corps. Seven National Guard and six Signal Reserve Officers graduated from the three months' officers course. In the enlisted specialists' school, 134 enlisted men of all combat arms were graduated. The officers' course covered the theory and operation of modern electrical communication equipment with their coördination and application for military purposes. Enlisted men were taught to be expert telegraph, telephone and radio operators and to be proficient in the management of signal communication stations.

FINANCE AND ACCOUNTING

The Finance School standardizes and develops the instruction and training of officers in the administrative and technical duties of the Finance Department and trains selected enlisted men of the Finance Department in their administrative and technical duties. It provides a resident course for such military person-

nel, mainly enlisted men, as are sent to the School by the War Department; a Home-Study Course for military and civilian personnel of the Finance Department unable to attend the School in person; and it prepares the Finance Sub-courses of the War Department Correspondence Course, used in the theoretical education of Finance Reserve Officers. The resident school course is divided into courses in Property Auditing and Finance and Accounting, which were added to the curriculum in 1928, the period of instruction being lengthened by three weeks for each class. As a result, a number of graduates of the 16th and 17th Class, trained in the correct procedure of property accounting and auditing, were made available for field service as assistants to Property Auditors; thus creating a reserve as replacements for those leaving the service. The finance and accounting part of the course includes instruction in the fundamentals of Army finance and accounting and the study of laws and regulations relating to disbursements. With its small instructional force of 12, including its Commandant, the Finance School has, since its establishment in 1920, graduated 552 students. Winter training is carried on by the Finance School for the Organized Reserves with a view of fitting them for their duties in case they are called to active duty under mobilization plans.

MEDICAL AND ALLIED SERVICES

The Army Medical School conducts basic and advanced courses for officers and enlisted specialists. The basic course is in the nature of a post-graduate study of certain professional subjects in their application to military conditions. The advanced course is a post-graduate study in medical specialties such as surgery, clinical medicine, clinical pathology, preventive medicine, roentgenology, ophthalmology and oto-rhinology. The enlisted specialist courses are for the purpose of preparing certain selected enlisted men of the Medical Department to become bacteriological, chemical and *x*-ray technicians. An important function of the Army Medical School is the manufacture of vaccines, bacterines, and sera for the use of the Army and of such other branches of the Government services as the Secretary of War may direct. The school also prepares the amboceptors, antigens, blood-grouping sera, agglutinating sera, culture media, and other laboratory supplies required. The school conducts scientific research and investigations for the prevention, control and treatment of diseases.

The Medical Field Service School at Carlisle Barracks, Pa., is a tactical school of the Medical Department. The school is maintained to standardize and develop the instruction and training officers in the tactics and technique of the Medical Department and to prepare them as instructors with the National Guard, the Organized Reserve and the Reserve Officers' Training Corps. It conducts an advanced course for the training of senior officers in the duties pertaining to division, corps and army surgeons. Courses are also offered for the instruction and training of Medical Department officers of the National Guard and the Organized Reserve in the field duties pertaining to the Medical Department. Enlisted men of the Medical Departments of the Regular Army and the National Guard are trained at this school for duty as non-commissioned officers and as instructors.

The Army Dental School trains officers of the Dental Corps in post graduate professional and technical subjects pertaining to the dental service of the Medical Department. It conducts an advanced course in advanced dental technique and trains selected enlisted men of the Medical Department for the duties of dental technicians, hygienists and mechanics.

The Army School of Nursing.—This school conducts a three-year course in nursing at the Walter Reed General Hospital, Army Medical Center. It gives a complete course in nursing and its graduates are eligible for state registration, membership in the American Nurses' Association, the American Red Cross

Nursing Service and for appointment in the Army Nurse Corps. It is recognized as one of the superior nursing schools in the country and its graduates are making enviable reputations.

The Army Veterinary School trains officers of the Veterinary Corps in post graduate professional and technical subjects pertaining to the veterinary service and conducts an advanced course in veterinary medicine and surgery. It also trains selected enlisted men in veterinary specialties which qualifies them for duty as assistants to veterinary officers.

ORDNANCE SCHOOLS

Watertown Arsenal.—Course I of this school is given at the Massachusetts Institute of Technology and covers a period of one year. It consists in general of an advanced mechanical engineering course with special reference to the design of ordnance material. Course II of the school is given at Watertown Arsenal for a period of approximately one year and gives such subjects as metallurgy and foundry and machine shop operation.

Raritan Arsenal.—Another school for ordnance officers and enlisted men is at Raritan Arsenal where officers are given a course in the construction and operation of all classes of material issued to the Army by the Ordnance Department, while enlisted men are given a similar course and also courses in trades pertaining to ordnance supply and maintenance.

Ordnance Officers in College.—Two officers of the Ordnance Department were graduated from the Harvard Graduate School of Business Administration in 1928. One officer, taking a special course in mathematics and ballistics, was graduated from Brown University. Practical courses along industrial lines have been given to several officers at the works of commercial concerns.

CHEMICAL WARFARE INSTRUCTION

The Chemical Warfare School at Edgewood Arsenal, Md., strives to give officers of all branches such an understanding of chemical warfare as will enable them to command their units with the maximum efficiency in respect to this phase of warfare. The two Navy Line Officers' Courses teach the tactical uses of chemical agents, the methods of protecting against such agents and the new developments in chemical warfare.

The Naval Constructor's Course, given to officers of the Construction Corps of the Navy, is designed to instruct in the technical side of chemical warfare in order that they may have a thorough understanding of this subject to aid them in designing ships for the Navy.

The Field Officers' Course is given to field officers of the Army and Marine Corps, who will occupy control positions or other important assignments in their own branches in modern developments of chemical warfare both in the United States and in foreign countries.

The Unit Gas Officers' Course teaches junior officers of the Regular Army, National Guard, Organized Reserve and Navy to act as gas officers in their own organizations. Methods of protecting personnel and material from gas attacks are the principal studies.

QUARTERMASTER SCHOOLS

Instruction Agencies and Courses.—The agencies for Quartermaster instruction are the Quartermaster Corps Special Schools, Command and General Staff School, Army War College, Army Industrial College, and Schools for Bakers and Cooks. Under the provisions of the National Defense Act, regular quartermasters are detailed to pursue specific technical courses at civil institutions. Babson Institute, Harvard (Course of Business Administration), Massachusetts Institute of Technology, The University of Michigan and the French Supply School, L'École de l'Intendance are some of the institutions at which our Quartermaster officers have been trained. The Quartermaster Corps School at Philadelphia conducts a general course in the higher duties of the Quartermaster Corps, embracing studies in administration,

functions of the supply service, transportation service, construction service, remount service, business management, mobilization plans, military organization, logistics and field exercises.

Motor Transport.—At Camp Holabird, Md., is located the Motor Transport School, dealing with technical instruction of a specialized nature in motor transport. The instruction given in the officers' regular course covers the principles and practice of operation, as well as the fundamentals of motor transport equipment.

Subsistence School.—At Chicago is the Quartermaster Corps Subsistence School, with specialized instruction in the purchase, inspection, storage, and issue of supplies, nutrition and the messing of troops. The work and research at this school has progressed to such an extent that texts prepared by the Subsistence School on foods and food products and the messing of troops are now recognized as authorities on the subjects in this country and abroad. Inactive duty training has been continued throughout the year by means of conferences held in 18 cities throughout the country. Approximately 1,500 reserve officers received such training. Of those assigned to the branch assignment group, 394 were given active duty training with units or installations of the Regular Army and 20 were trained in the Office of the Quartermaster General. It is the practice to assign reserve officers to the duties to which they will be assigned in the event of mobilization.

AVIATION

The Army Air Corps schools furnish the best courses in flying in the world. The instruction is open to any male citizen of the United States who has reached the age of 20 and who is not over 27. Applicants must have completed at least two years of college work or be able to pass an examination equivalent thereof. The applicant must be unmarried and must pass a strict physical and psychological examination before being admitted as a flying cadet. Flying cadets are given a year's course in either heavier-than-air or lighter-than-air training. In the heavier-than-air training, students spend the first eight months at a primary flying school and upon satisfactory completion of the course are transferred to the advanced flying school. Students are also trained in airplane engines, navigation, machine guns, radio and other academic subjects necessary for a military pilot. The completion of the course includes approximately 250 hours in the air. Graduates are rated "Airplane Pilot" and commissioned without further examination as second lieutenants in the Air Corps Reserve. In lighter-than-air training, students are given instruction in such military and aeronautical subjects as is necessary to qualify them as airship (dirigible) pilots, as well as in balloon observing. The flying course consists of approximately 175 hours in the air. Graduates are rated both as "airship pilots" and "balloon observers" and are commissioned as second lieutenants in the Air Corps Reserve. The Technical School at Chanute Field is probably the largest one of its kind in the United States and for practical mechanical courses it cannot be equaled.

The School of Aviation Medicine, located at Brooks Field, Tex., although functioning under the direction of the Chief of Air Corps, is conducted by medical officers of the Army for the training as flight surgeons, for either military or civilian service.

Limitations of Flying Training.—Last year Congress appropriated for 16,500 hours of flying for reserve officers. Since the limited number of hours could not possibly be distributed among the 3000 reserve officers with aeronautical ratings, it was necessary to segregate those most fitted for flying. Corps area commanders were instructed to divide reserve pilots into three classes: those capable of flying serviceable type equipment without additional instruction; those capable of flying training-type equipment who, with a little refresher flying training, could be taught to fly service type equipment safely; and those who did not fall into either

of the above classes. To give to the best qualified the number of hours allotted, flying training had to be limited to the first two classes.

Flying Demonstrations.—The air force of the Army Air Corps has in the past engaged in a series of annual maneuvers. They were changed in 1928 into a series of demonstrations at each of the service schools. A group composed of 72 officers and 86 enlisted men, flying in 74 airplanes, visited the Air Corps Tactical School, Langley Field, Va.; the Infantry School, Fort Benning, Ga.; the Field Artillery School, Fort Sill, Okla.; the Cavalry School, Fort Riley, Kan. and the Command and General Staff School, Fort Leavenworth, Kan. These demonstrations were reported well worth the work and expense involved.

Changes in Pilot Training.—Because of the necessity for securing a larger number of graduate pilots from our flying schools, the methods employed and the courses of instruction given were carefully analyzed and checked during the past year. Some important changes have been made. To date, the number of graduates, compared with the number of entrants, has been less than 25 per cent. With the present system and the careful attention being paid to this phase of Air Corps work, the number of graduates should be increased to more than 40 per cent of entrants. One of the changes which has brought about this desirable result is raising the standard of qualifications of those who enter training. Interest in flying training, as a result of spectacular flights and general air activity, has made it possible to get a much higher type of personnel. The class now under instruction at the flying schools is composed largely of college graduates. Over 200 qualified applicants were not taken because they could not be accommodated at the flying schools. The flying schools have important functions: first, they provide qualified pilot personnel for our regular Air Corps establishment; second, they provide training for all the Air Corps flying reserve.

GENERAL TRAINING

Tactical training culminates in maneuvers conducted under field service conditions. All units of the Regular Army in the continental United States, Hawaii, and Panama averaged over two weeks in the field in 1928, in many cases a longer time. Mobile troops of the First, Third, and Eighth Corps Areas and of all oversea departments were concentrated for tactical training in the employment of the combined arms. Coast Artillery battle practice was conducted at selected harbor defenses on the Atlantic and Pacific coasts. In exercises on Long Island Sound, a portion of the Scouting Fleet gave the exercises the character of a minor joint Army and Navy maneuver. At Fort Story, Va., the observation units of the Air Corps participated in the minor joint exercises and Coast Artillery battle practice. The annual machine-gun and bombing exercises at Langley Field, Va., were of greater magnitude than ever before. Attack, pursuit, and bombardment aviation units participated. The development of defense against aircraft is being continued by ground troops.

Experimentation, development, and training in the delivery and control of fire by anti-aircraft batteries and anti-aircraft machine guns have shown marked improvement. The adoption of superior fire-control devices has aided materially in the accuracy and control of fire against aircraft. The distribution of forces in the continental United States during peace necessarily is based upon requirements for maintenance of installations and such a balance between various components of the Army as will provide maximum utilization of the Regular Army as an instrumentality of instruction. The dispersion of units is such as to preclude opportunity for maneuvers of large forces. As a result, practical experience in command and staff work with large commands rarely has been available to officers. In order to afford them some training in handling armies, corps, and divisions in campaign, and at the same time to eliminate the costs incident to the assembling of large bodies of troops, the

War Department has prescribed command post exercises, which differ from maneuvers in that only the commanders, staffs, and communication and reconnaissance personnel of units are present, the troops being imaginary.

MILITARY AND NAVAL PENSIONS

By Winfield Scott

Commissioner, U. S. Pension Bureau

ADMINISTRATION

Number of Pensioners.—The administration of all Federal laws relating to pensions and the civil service retirement fund is under the jurisdiction of the Bureau of Pensions. At the close of the fiscal year ending June 30, 1928, there were 491,194 pensioners on the rolls, and 15,383 retired Federal employees drawing monthly payments from their "retirement fund,"—a fund created by withholding 3½% from the pay of the civil service employees.

The record indicates that there are only 74,929 survivors out of the 2,213,365 individuals who were recorded in the military and naval service of the United States during the Civil War. Of these, 31,528 receive $50 per month; 35,900, $72 per month, and 6,818, $90 per month.

Besides the Civil War veterans there are 197,934 Civil War widows; 165,075 Spanish War veterans; and 26,195 Spanish War widows and dependent relatives. During the past year there has been a marked increase in the number of claims based upon the condition of total helplessness or blindness; 15,237 names of Civil War veterans have been dropped from the roll on account of death.

Pension Disbursement.—The total amount disbursed for pensions during the fiscal year 1928 was less than $229,000,000, a decrease of nearly $1,200,000 as compared with the amount disbursed during 1927. The expenditures for Civil War pensions decreased $16,824,232.39, but this was counterbalanced by an increase of $13,441,590.97 to Spanish War pensioners, $1,943,177.39 to the Indian War pensioners and nearly $200,000 for the disabled veterans from the regular establishment.

Roster.—For more than twenty years the number of pensioners has been decreasing at an average of 10,000 a year; but in 1927-28 the number of names on the rolls was increased by 1252. It now appears that the annual loss in numbers, caused by death among the aged and badly disabled veterans, may be offset by the increasing number of claims under the provisions of the Spanish War Act of May 1, 1926, and the Indian War Survivors' Act of March 3, 1927, as well as the special acts of Congress which provide for many veterans and widows not covered by general legislation.

Pension Grants.—The number of pensions granted by special acts of each Congress since March 4, 1897, are as follows:

Fifty-fifth Congress	(1897-1899)	694
Fifty-sixth Congress	(1899-1901)	1,391
Fifth-seventh Congress	(1901-1903)	2,171
Fifty-eighth Congress	(1903-1905)	3,355
Fifty-ninth Congress	(1905-1907)	6,030
Sixtieth Congress	(1907-1909)	6,600
Sixty-first Congress	(1909-1911)	9,549
Sixty-second Congress	(1911-1913)	6,350
Sixty-third Congress	(1913-1915)	5,061
Sixty-fourth Congress	(1915-1917)	5,885
Sixty-fifth Congress	(1917-1919)	3,641
Sixty-sixth Congress	(1919-1921)	2,200
Sixty-seventh Congress	(1921-1923)	2,319
Sixty-eight Congress	(1923-1925)	2,436
Sixty-ninth Congress	(1925-1927)	5,375
Seventieth Congress, 1st Ses.	(1927 to date)	3,596
Total		66,753

This is an average of more than 2200 a year for the past thirty years. Of these pensioners there were 10,036 on the rolls in 1928.

At the close of this fiscal year 13 widows of soldiers of the War of 1812 survive; 845 widows and 4 surviving soldiers of the Mexican War; 3604 surviving widows and 5267 surviving soldiers of the Indian Wars

were on the pension rolls. None in these three groups, the remnants of the large number who were affected by the wars above indicated, is a pensioner under the general laws for disabilities contracted in service, but is on the rolls under the beneficent legislation of a generous nation in recognition of a debt of gratitude which takes into consideration the infirmities of age as the controlling disability.

The number of checks prepared and mailed in the past fiscal year was 6,115,660 carrying an aggregate of $244,222,970.46, in payment of the total amount of the annual disbursement.

BUREAU OF PENSIONS FUNCTIONS

Card Index Record.—While the chief functions of the Pension Bureau are the adjudication of claims, the payment of pensions and the administration of laws making provision for the retirement of Civil Service employees, the bureau also maintains certain educational activities. The large number of claims filed for adjudication made it necessary to evolve a system by which any one of them might be located readily. A card record index which required more than 7,000,000 cards was adopted and it is believed to be as nearly perfect as could be established, when dealing with records of such magnitude where accuracy is essential.

Files Used for Research.—The files of the Pension Bureau, commencing with the Revolutionary War claims, have become a storehouse of historical data and are consulted by thousands engaged in historical and genealogical research work, either general or personal in character. The millions of claims based on Civil War service, and the printed volumes and unpublished manuscripts in the bureau reference library, continue to attract students of history in steadily increasing numbers.

Claims Adjustment.—When the act of Congress granting an increase of pension from $30 to $40 to Civil War widows over seventy-five years of age was approved by the President on May 23, 1928, it became necessary to draw from the files 173,000 cases and examine them to ascertain the age, and allow the increase to 103,858 of these widows. This work was accomplished expeditiously and with great accuracy notwithstanding a recent heavy reduction in the number of the clerical force familiar with this character of work.

The bureau has handled during the past year, in addition to claims based upon service in the Civil War, the Spanish War, and the Indian Wars, a large increase in the number of claims based upon death or disability due to service and in line of duty since the World War; claims for accrued pension; claims for reimbursement of expenses of last sickness and burial of deceased pensioners; and claims filed by deserted wives and children of pensioners. Of the 190,209 claims filed 147,620 were adjudicated before the close of the fiscal year, June 30, 1928.

Double Pensions.—Under an act of Congress approved April 27, 1928, pensions granted on account of death or disabilities due to an accident to a submarine vessel shall be double the amount of that otherwise payable. A double pension is now provided also for death or disability resulting from an aviation accident occurring to an officer or an authorized flyer in the United States Navy.

UNITED STATES VETERANS BUREAU

By Frank T. Hines

Director, United States Veterans Bureau

COMPENSATION AND CARE

Military and naval compensation is awarded for death or disability resulting from personal injuries received, for disease contracted, or for aggravation or recurrence of pre-

existing disability during or as the result of military service in the World War. On October 1, 1928, compensation was being paid to 258,480 disabled veterans and to 87,274 dependents of deceased veterans of the World War. During the year ending October 1, 1928, 25,365 new claims for compensation were received by the Bureau and approximately 400,000 adjudications of claims effected.

Hospitals.—In addition to compensation benefits, the veteran of the World War with any service-connected disability is furnished with medical, surgical and hospital care. The Director of the Bureau may, when it appears necessary, supply disabled veterans with appliances such as wheel chairs, artificial limbs, trusses, etc.

In order to carry out the provision for care and treatment of the disabled veterans, the Bureau as of October 1, 1928, was operating forty-nine hospitals, and beneficiaries of the Bureau were also being provided with care and treatment in forty-seven other government hospitals and in one hundred and fifty-five civil and state institutions. For the act governing the hospitalization of discharged veterans with non-service-connected disabilities see AMERICAN YEAR BOOK for 1927.

The total number of ex-service men and women who had received hospital treatment as of October 1, 1928, was 401,242, while 73,270 patients were admitted to hospitals during the past year. The number of patients remaining in the various types of hospitals utilized by the Bureau as of October 1, 1928, is as follows:

	T. B.	N. P.	General	Total
U. S. Veterans'..	4,976	10,634	3,212	18,822
Other Government	1,097	1,452	3,344	5,893
Civil and State..	434	1,143	157	1,734
Total	6,507	13,229	6,713	26,449

Out-Patient Relief.—The Bureau also provides out-patient relief in the clinics established in the field stations for veterans whose disabilities do not require hospital treatment. During the past year a total of 821,741 out-patient treatments were given, while a total of 855,472 examinations were made outside of hospitals.

GUARDIAN SYSTEM

The World War Veterans' Act provides that whenever it appears that any guardian, curator, conservator or other person is not, in the opinion of the Director, properly executing the duties of his trust, or has collected or attempted to collect fees or commissions that are inequitable or in excess of those allowed by law, or has failed to make such payments as are necessary for the benefit of the ward, the Director is empowered by his duly authorized attorney to appear and make proper presentation of such matters to the court. Under this provision, it is incumbent upon the Bureau to secure the appointment of persons properly qualified to act as guardian and to secure the removal of guardians who have demonstrated their unfitness.

Procedure.—Assistance is rendered to the next of kin in qualifying as guardians of beneficiaries. When it is not possible to find a qualified next of kin to act, reputable banks and trust companies are utilized. The adequacy and solvency of guardian bonds is carefully looked into and, when insufficient, recommendation is made to the court that larger bonds be required for the protection of the estate. Guardians are advised of the legal rights of their wards in order that incompetents and minors may receive all the benefits to which they are entitled. A constant endeavor is made to reduce the guardians' commissions and attorneys' fees to a minimum. To this end regional attorneys of the Bureau, with the cooperation and assistance of service and welfare organizations, have been instrumental in securing legislation in some states reducing court costs, commissions and fees. Social surveys are made semi-annually of all minors under guardianship, for the purpose of ascertaining the manner in which funds paid by the Bureau are applied to the benefit of the ward and for the

further purpose of removing any unfavorable conditions that may be disclosed. On October 1, 1928, the Bureau had under its jurisdiction 52,821 wards, of which 30,491 are minors, 21,509 are incompetent veterans and 821 are incompetent dependents of deceased veterans.

AIDS AND PAYMENTS

Vocational Training.—Each honorably discharged veteran of the World War receiving compensation or suffering from a vocational handicap as a result of service who, in the opinion of the Director, was in need of vocational rehabilitation, was eligible for training. The act of June 7, 1924, provided that all original entrance into training would be discontinued as of June 30, 1925, and that training of all types would be discontinued as of June 30, 1926. However, the act of July 2, 1926, amended the latter provision so that trainees could be continued in training for a period not to exceed two years for institutional training, and six months for placement training. As a result of these limitations the training program was completed July 2, 1928. A total of 179,389 veterans were inducted into training. Of this number 128,486 were rehabilitated or completed the prescribed course, and the remainder discontinued training or died.

Insurance.—United States Government Life Insurance is issued in any multiple of $500, not less than $1,000 or more than $10,000, upon the payment of premiums at a net peace time rate, with no extra charge for administration or excess mortality due to the hazards of war. The following forms of insurance are issued: ordinary life, 20-payment life, 20-year endowment, 30-payment life; 30-year endowment, endowment at age 62, and 5-year convertible term insurance. The policies carry the usual values common to policies issued by commercial companies, such as extended insurance, paid-up insurance, cash surrenders and loans. Dividends are also paid from excess of interest earnings and savings in mortality. Under the original provision, yearly renewable term insurance was issued. Legislative provisions required that all such insurance should be converted into one of the permanent forms enumerated above not later than July 2, 1927. The following table shows a classification of the insurance in force as of October 1, 1928:

	Number	Amount
U. S. Gov't Life:		
Ordinary Life.	135,277	$ 731,162,414.82
20-Paym't Life	169,115	744,215,460.74
30-Paym't Life	28,671	147,704,553.30
20-Yr. Endowment	130,645	391,544,389.98
30-Yr. Endowment	35,288	151,547,033.57
Endowment at Age 62	34,896	170,498,889.52
Extended Ins..	18,887	52,895,137.36
5-Yr. Converted Term Ins.	101,846	695,888,690.29
Total	654,625	$3,085,456,569.58

Adjusted Compensation. — The World War Adjusted Compensation Act, passed by Congress May 9, 1924, authorized the payment of adjusted compensation to all veterans of the World War, but does not include any officer above the grade of captain in the Army or Marine Corps or similar rank in the Navy and Coast Guard. The rate of pay for service in excess of sixty days is $1.25 and $1.00 per day, and the amount of credit is limited to $625 and $500 for overseas and home service respectively. The veterans who are entitled to not more than $50 are paid in cash, and those entitled to more than $50 are given an adjusted service certificate in the form of a 20-year endowment insurance policy for an amount that the adjusted service credit increased by 25% would purchase at the age of the veteran on the birthday nearest the date of the certificate, if applied as a single net premium, calculated in accordance with the accepted actuarial principles and based upon the American Experience Table of Mortality, with interest at four per centum compounded annually. An amendment to the World War Adjusted Compensation Act authorized the Bureau to make loans direct to the veteran; prior to the passage of this amendment loans secured by ad-

justed service certificates could be made only by the banks.

ADJUSTED COMPENSATION

As of October 1, 1928

	Number	Amount
Applications Received	3,616,117	
Applications Acted Upon:		
Cash Payments.		
Veterans ($50 or less)	118,177	$4,135,749.71
Dependents ($50 or less)	5,866	154,378.24
Total Cash Payments	123,866	4,290,127.95
Dependents (over $50)	88,308	31,763,764.58
Certificates	3,360,706	3,419,701,677.00
$60 Lump Sum Payments		1,539,190.00
Total	3,572,880	$57,022,265.00
Death Claims Approved	55,975	$57,022,265.00

LOANS BY THE BUREAU

As of September 1, 1928

Number	827,196
Amount	$80,613,261.32
Cash Collections	1,741,150.20

NEW LEGISLATION ON U. S. VETERANS

World War Veterans' Relief.—The Senate and House of Representatives have passed H. R. 13039, "A bill to amend the World War Veterans' Act, as Amended," which contains many important provisions, as follows: A statute of limitations on insurance suits providing that suits on contracts of insurance must be brought within six years after the claim accrues or one year after the passage of the act, whichever is the later. At the present time, under the Conformity Act, the statutes of limitation of the different states apply: for payment of original expenses of appointment of guardian; for the payment of death compensation to a child after the age of 18 and until the completion of education or training (but not after such child reaches the age of 21 years); for the payment of compensation to dependent parents to be made during the period of dependency, and for compensation to be payable whether the dependency arises before or after the death of the veteran; for payment of burial expenses in the amount of $107 in all cases in which the director, in his discretion and with due regard to the circumstances of each case, may decide that this sum be allowed.

Other provisions authorize the director, in his discretion, to apportion compensation in the case of a disabled person who is a patient in a hospital or is living separate and apart from his wife and/or children. This provision was made to overcome the difficulties now existing which make mandatory the apportionment of compensation to persons who are undeserving or in behalf of persons who have been separated from their families for many years or cannot be located; also to extend the time for filing evidence to establish service connection to April 6, 1930.

A provision which authorizes the director, in his discretion, to extend the time for filing claim for benefits under this act to April 6, 1930, is included; also a provision which permits the use of uncollected compensation not payable because of the provisions of section 310 of the War Risk Insurance Act and section 210 of the World War Veterans' Act, as Amended, for the purpose of reviving insurance under section 305 of the World War Veterans' Act, as Amended. This provision places the legislative stamp of approval on the interpretation of section 305 of the World War Veterans' Act, as Amended, heretofore made by the Bureau but which has recently been overruled by the Comptroller General.

The Act further includes the following provisions: Reconversion of insurance to a lower premium rate may be made upon proof of good health, satisfactory to the directors. The restriction on the designation of beneficiaries for United States Government life (converted) insurance is reserved. Application may be made for United States Government life (converted) insurance by any person who has heretofore applied or been eligible to apply for yearly renewable term insurance or United States Gov-

ernment life insurance, provided that such person is in good health and furnishes evidence satisfactory to the director to that effect. Persons now holding United States Government life insurance and who are in good health may apply for the insertion in their contract of a disability clause providing for the payment of disability benefits where total disability has existed for 12 months. The director, under this amendment, is required to fix a rate of premium for this added feature to the insured to cover the necessary cost of the same. Authority is given for payment of expenses of Medical examination, and inspections, when necessary in connection with the reinstatement of insurance or determination of permanent and total disability for insurance purposes, and the date of beginning or termination thereof.

Veterans' Hospitalization.—On May 23, 1928, the President affixed his signature to H. R. 12281, "A Bill to authorize an appropriation to provide additional hospital, domiciliary, and out-patient dispensary facilities for persons entitled to hospitalization under the World War Veterans' Act, 1924, as amended, and for other purposes," which authorizes an appropriation of $15,000,000 for the construction of additional hospital and out-patient dispensary facilities for the United States Veterans' Bureau.

Adjusted Compensation.—The Senate and House of Representatives have passed H. R. 10487, "A bill to amend the World War Adjusted Compensation Act, as Amended," which contains the following important provisions: extend the time for filing applications for benefits of the World War Adjusted Compensation Act to January 2, 1930; permission to the Secretary of the Navy and the Secretary of War to certify to the Veterans' Bureau the adjusted service credit of a veteran where an application has been made by the veteran but was lost after having been received by one of the departments; authorization of the presumption of death of an individual where he has been absent from his home and family for a period of seven years, during which period no information of his existence has been received; authority for veterans to designate more than one beneficiary under his adjusted compensation certificate. Penal provisions for false and fraudulent statements, and authorization of payments to the person found by the Director to be legally vested with the care of the person entitled to payment, or of his estate.

DISBURSEMENTS

The total disbursements made by the Bureau or agencies now comprising it, exclusive of certain expenditures made for hospital construction under the direction of the Treasury Department, approximates $4,450,729,995, of which $864,283,559.25 was from funds other than those appropriated by Congress, such as insurance premiums and allotments made by men in service to their dependents.

ORGANIZATION OF THE ARMY

By William Addleman Ganoe

Major, U. S. A.; Historical Section, Army War College

WAR DEPARTMENT

Organization.—The War Department, as the managing agency of the military forces for the people, is presided over by the Secretary of War, a civilian, who is answerable directly to the President of the United States, the Commander-in-Chief. The Secretary (Dwight F. Davis) is assisted by the Chief of Staff (Maj. Gen. Charles P. Summerall), who oversees the military functions; by an Assistant Secretary (C. B. Robbins), who has charge of the supply, real estate and war industrial plans; and by another Assistant (F. Trubee Davison), who is responsible for fostering military aeronautics. Under this com-

bined direction operate the divisions of the general staff and the arms and branches of the army, whose chiefs yield advice to the Secretary of War through the Chief of Staff, the Deputy Chief of Staff (Maj. Gen. Briant H. Wells) and the Assistant Secretaries.

THE GENERAL STAFF

Qualifications and Duties.—The general staff is composed of officers who are selected from all arms and branches of the army, and who are developed by long training and schooling to comprehend every side of the general problems studied by them. From these studies, they are required to present to their superiors broad and impartial conclusions for the best interests of the service. On the other hand, the chiefs of the combatant branches and supply and administrative departments are specialists whose force is trained to give technical and specific advice to the Secretary of War, through the Chief of Staff, concerning the particular conditions and the special problems which confront the individual branches and departments.

None of the officers of the general staff or heads or arms or departments enjoys the right to command. The duties of each are advisory, supervisory or administrative. The chain of command is direct from the President of the United States to the Corps Area Commanders in the matter of manipulation of the army of the United States. The Secretary of War, however, may give orders in the name of the President, to the nine areas of control in the United States proper, and to the four in other parts of the world.

Commands.—The general staff consists of five divisions, composed of officers of the regular army, National Guard and Organized Reserves. The G-1 Division (Brig. Gen. Campbell King, Assistant Chief of Staff, G-1) is concerned with personnel, the man-power of the army and nation. The G-2 Division (Colonel Stanley H. Ford, Assistant Chief of Staff, G-2) is concerned with world-wide information, collecting, evaluating and treating it much in the same manner as expert historians. The G-3 Division (Brig. Gen. Frank Parker, Assistant Chief of Staff, G-3) is concerned with the operation of the army, especially in education and training. The G-4 Division (Brig. Gen. Ewing E. Booth, Assistant Chief of Staff, G-4) is concerned with the housing and maintenance of the army. The War Plans Division (Brig. Gen. George S. Simonds, Assistant Chief of Staff, W.P.D.) is concerned with the up-to-date defense of our coasts and possessions at any point of possible attack.

ADVISORY BODIES

Combatant.—Other advisory bodies for the Secretary are the offices of the chiefs of the combatant arms and heads of departments and services. The combatant branches are: the Infantry (Major General Robert H. Allen, Chief); the Cavalry (Major General Herbert B. Crosby, Chief); the Field Artillery (Major General Fred T. Austin, Chief); the Coast Artillery (Major General Andrew Hero, Jr., Chief); the Air Corps (Major General James E. Fechét, Chief); the Corps of Engineers (Major General Edgar Jadwin, Chief); Signal Corps (Major General George S. Gibbs, Chief).

Non-Combatant.—The non-combatant branches are: Adjutant General's Department (Major General Lutz Wahl, the Adjutant General); Inspector General's Department (Major General William C. Rivers, the Inspector General); Judge Advocate General's Department (Major General John A. Hull, the Judge Advocate General); Quartermaster Corps (Major General Frank B. Cheatham, the Quartermaster General); Finance Department (Major General Roderick L. Carmichael, Chief); Medical Department (Major General Merritte W. Ireland, the Surgeon General); Ordnance Department (Major General Clarence C. Williams, Chief); Chemical Warfare Service (Major General Amos A. Fries, Chief); officers of the Bureau of Insular Affairs (Major General Frank McIntyre, Chief); and officers and enlisted men of the Mi-

A.—TABLE SHOWING THE STRENGTH OF THE REGULAR ARMY, BY CORPS AREAS, ETC., FISCAL YEAR ENDED JUNE 30, 1928

Corps Area, Department, or Country	July, 1927			June, 1928		
	Officers	Warrant Officers	Enlisted Men	Officers	Warrant Officers	Enlisted Men
First Corps Area	536	79	4,227	488	78	4,458
Second Corps Area [1]	1,092	134	10,653	1,099	133	10,443
Third Corps Area	1,000	133	9,793	1,986	171	12,769
Fourth Corps Area	1,078	92	10,399	1,087	92	10,510
Fifth Corps Area	611	92	3,525	496	87	3,649
Sixth Corps Area	588	71	5,277	562	68	5,431
Seventh Corps Area	885	88	7,041	906	88	7,585
Eighth Corps Area	1,766	153	18,476	1,784	157	20,452
Ninth Corps Area [2]	1,158	161	12,720	1,006	150	10,631
District of Columbia	976	65	3,346	...	...	...
Total in continental United States [3]	9,690	1,068	85,457	9,414	1,024	85,928
Hawaiian Department	746	61	12,966	688	63	13,332
Panama Canal Department [4]	448	46	7,854	404	44	8,157
Alaska	14	2	236	12	2	296
Porto Rico	67	5	1,453	67	4	1,211
Philippine Department:						
Regular Army	525	70	3,875	553	65	4,239
Philippine Scouts	89	...	6,871	86	...	6,400
U. S. Army Forces in China	59	2	967	59	2	918
Europe [5]	3	5	...	3	4	...
Miscellaneous [6]	418	...	935	826	...	704
Grand total	12,059	1,259	120,614	12,112	1,208	121,185

[1] Excluding Porto Rico.
[2] Excluding Alaska.
[3] Including personnel of the retired list on active duty.
[4] Includes Panama civil government.
[5] American Graves Registration Service.
[6] Includes military attachés, personnel on leave, and en route to and from oversea garrisons.

litia Bureau (Major General Creed C. Hammond, Chief).

CORPS AREA

For command and control, the army is spread as follows: First Corps Area, including Maine, New Hampshire, Vermont, Massachusetts, Rhode Island and Connecticut, is commanded by Major General Preston Brown; Second Corps Area, including New York, New Jersey, Delaware and Porto Rico, by Major General Hanson E. Ely; Third Corps Area, including Pennsylvania, Maryland, Virginia and District of Columbia, by Major General Fred W. Sladen; Fourth Corps Area, including North Carolina, South Carolina, Georgia, Florida, Alabama, Tennessee, Mississippi and Louisiana, by Major General Richmond P. Davis; Fifth Corps Area, including Ohio, West Virginia, Indiana and Kentucky, by Major General Dennis E. Nolan; Sixth Corps Area, including Illinois, Michigan, Wisconsin, Jefferson Barracks and Arcadia Target Range, Missouri, by Major General Paul B. Malone; Seventh Corps Area, including Missouri (Arcadia Range excepted), Kansas, Arkansas, Iowa, Nebraska, Minnesota, North Dakota and South Dakota, by Major General Harry A. Smith; Eighth Corps Area, including Texas, Oklahoma, Colorado, New Mexico and Arizona, by Brig. General Albert J. Bowley (temp.); Ninth Corps Area, including Washington, Oregon, Idaho, Montana, Wyoming, Utah, Nevada, California and Alaska, by Major General John L. Hines; the Hawaiian Department, by Major General Fox Conner; the Philippine Department, by Major General Douglas MacArthur; the Panama Canal Department, by Major General Malin Craig; and the U. S. Army Forces in China, by Brig. General Joseph C. Castner. These areas and departments are subdivided into tactical divisions and brigades.

B.—TABLE SHOWING THE STRENGTH OF THE REGULAR ARMY OF THE UNITED STATES, JUNE 30, 1927, AND JUNE 30, 1928, AND LOSSES DURING THE FISCAL YEAR INTERVENING

Branch of Service	Strength June 30, 1927		Strength June 30, 1928		Losses															
					Enlisted Men															
							Discharged				Died									
	Officers	Enlisted Men	Officers	Enlisted Men	Retired	Relieved from Active Duty	Expiration of Service	For Disability	By Sentence of General Court-martial	Other Causes	Of Disease	Of Accident	Drowned	Suicide	Homicide	Deserted	Dropped [1]	Total	Enlisted Men Returned from Desertion
General Officers of the Line	67	...	67	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
General Staff Corps	211	...	213	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Adjutant General's Department	96	...	97	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Inspector General's Department	42	...	39	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Judge Advocate General's Department	88	...	89	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Quartermaster Corps	701	7,794	707	7,363	62	...	1,354	92	121	1,042	27	4	3	1	1	563	81	3,351	266
Medical Department	1,199	6,743	1,201	6,595	24	...	1,357	150	138	1,034	23	4	3	7	...	695	54	3,489	345
Finance Department	120	390	121	394	3	...	65	5	...	34	2	...	...	...	...	8	...	117	2
Corps of Engineers	396	4,646	406	4,468	17	...	785	111	74	749	9	6	1	...	...	377	64	2,193	185
Ordnance Department	271	2,220	271	2,346	51	...	423	24	45	267	7	...	1	3	...	137	11	969	70
Signal Corps	213	2,362	210	2,344	12	...	363	41	28	436	8	...	...	...	...	165	7	1,060	79
Chemical Warfare Service	80	418	81	450	1	...	119	5	16	54	1	2	...	...	...	21	4	223	23
Bureau of Insular Affairs	3	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Chaplains	123	...	120	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Professors, U. S. Military Academy	8	...	8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Cavalry	650	8,126	626	8,020	40	...	1,584	93	193	1,396	19	10	...	2	2	1,168	224	4,731	632
Field Artillery	969	14,376	960	15,044	30	...	3,653	232	324	2,178	13	16	2	2	3	1,609	295	8,357	794
Coast Artillery Corps	724	11,818	708	11,737	61	...	1,921	208	229	1,801	30	5	1	2	3	819	107	5,187	384
Infantry	2,455	39,574	2,441	41,005	153	...	8,086	783	790	6,464	97	27	13	14	6	4,217	852	21,502	2,139
Air Corps	902	9,077	1,025	9,493	20	...	1,619	106	90	2,110	19	18	...	8	1	466	56	4,513	256
Detached list	2,498	5,497	2,480	5,498	100	...	880	46	54	448	18	6	2	5	1	222	40	1,822	107
Total, less Philippine Scouts	11,816	113,041	11,872	114,757	574	...	22,209	1,896	2,102	18,013	273	98	26	44	17	10,467	1,795	57,514	5,282
Philippine Scouts:																			
Judge Advocate General's Department	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Quartermaster Corps	9	470	10	469	...	...	101	6	1	2	...	1	...	...	...	1	...	112	...

TABLE B—(Continued)

Branch of Service	Strength June 30, 1927		Strength June 30, 1928		Losses																
					Enlisted Men																
							Discharged				Died										
	Officers	Enlisted Men	Officers	Enlisted Men	Retired	Relieved from Active Duty	Expiration of Service	For Disability	By Sentence of General Court-martial	Other Causes	Of Disease	Of Accident	Drowned	Suicide	Homicide	Deserted	Dropped [1]	Total	Enlisted Men Returned from Desertion
Medical Department	...	385	...	319	...	...	173	2	...	5	...	...	...	...	...	1	...	181	1
Finance Department	...	8	...	8	...	...	3	...	...	...	...	...	...	...	...	...	...	3	...
Corps of Engineers	4	323	3	314	...	...	51	4	1	1	...	...	...	...	...	...	...	57	...
Ordnance Department	...	49	...	48	...	...	11	...	...	...	...	...	...	...	...	...	...	11	...
Signal Corps	3	148	4	129	...	...	37	1	...	5	...	...	...	...	...	...	...	43	...
Cavalry	6	676	6	609	...	...	141	10	2	3	1	...	...	...	...	...	...	157	2
Field Artillery	8	891	8	874	...	...	157	6	3	4	...	...	...	...	...	...	...	170	1
Coast Artillery Corps	12	1,570	12	1,478	...	...	242	6	...	5	2	1	...	...	...	1	1	258	...
Infantry	51	2,343	46	2,152	...	...	370	19	1	8	6	...	...	...	...	1	...	405	1
Air Corps	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Detached list	2	...	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total	97 [1]	6,863	94 [1]	6,400	...	...	1,286	54	8	33	9	2	...	...	...	4	1	1,397	5
Grand total	11,913	119,904	11,966	121,157	574	...	23,495	1,950	2,110	18,046	282	100	26	44	17	10,471	1,796	58,911	5,287
Warrant Officers:																			
Army Mine Planter Service	40	...	40	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Band Leaders	92	...	93	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Others	1,130	...	1,075	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total	1,262	...	1,208	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Retired, on active duty:																			
Regular Army	145	25	133	28	...	3	...	...	...	...	...	...	...	...	...	...	...	3	...
Philippine Scouts	18	...	13	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Warrant officers	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total	164	25	146	28	...	3	...	...	...	...	...	...	...	...	...	...	...	3	...
Aggregate	13,339 [2]	119,929	13,320 [2]	121,185	574	3	23,495	1,950	2,110	18,046	282	100	26	44	17	10,471	1,796	58,914	5,287

[1] Includes only officers commissioned in the Philippine Scouts.

[2] Includes warrant officers.

OTHER DEPARTMENTS

Directly under the supervision of the Secretary of War, but not belonging to the army, come the activities of Insular Affairs, Panama Canal, Inland and Coastwise Waterways, River and Harbor improvement, and other civil work, such as administrative duties in the District of Columbia, largely performed by members of the army personnel.

ARMY STRENGTH

The strength of the Army of the United States on June 30 was: Organized Reserves, 114,824 officers (including 9,765 officers of the National Guard) and 5,464 enlisted men; National Guard 10,909 officers and 166,519 enlisted men; Regular Army, 13,320 officers (including 1,315 Philippine Scout and Warrant Officers) and 121,185 enlisted men (including 6,400 Philippine Scouts).

ACCOMPLISHMENTS OF ARMY PERSONNEL

By William Addleman Ganoe

Major, U.S.A., Historical Section. Army War College

PUBLIC SERVICE

Contribution of the Soldier.—The Army of the United States is designed and operated to maintain peace during quiet times and to gain it during turmoil, and to be so technically and physically sound when suddenly called upon to gain a victory that there will be a minimum of bloodshed. Just as it has been the greatest single factor in the building of the nation, so it works with as great contributive value in peace as in war. A great part of the sum spent upon it annually goes directly back to the people in the form of peacetime upbuilding. Another large proportion of the money, though it does have a bearing upon national defense, is used to aid the civic and commercial needs of the public. Some of these economic returns will be shown by the accomplishments of the special services and branches of the army, and the various War Department agencies.

Relief Work.—The army's work in the relief of sufferers during disaster has been widespread and indispensable. Control of traffic and protection of property are other activities undertaken by officers and soldiers of the Regular Army. In March, 1928, towns in northern Michigan, isolated by heavy snows, were provided with mail and supplies by an army transport plane. In the same month, when a heavy blizzard disrupted all telegraph service between Omaha and Chicago, the army radio station in the latter city restored communication. In April, tentage was furnished for the shelter of flood sufferers at Texarkana, Ark. These varied calls upon the personnel and supplies of the War Department were by no means unusual. During the past four fiscal years the Regular Army, frequently in conjunction with the American Red Cross, has furnished personnel or supplies, or both, on the occasion of 24 emergencies. Floods, tornadoes, cyclones, typhoons, bursting dams, ice jams, coal-mine disasters, explosions, forest fires, conflagrations, and earthquakes found the army prepared to render prompt and efficacious service for the alleviation of suffering and the protection of life and property to communities in a great number of states and in Porto Rico and the Philippine Islands.

WORK OF QUARTERMASTER CORPS

Civilian Activities.—The Quartermaster Corps' horse-breeding plan has caused the production of superior riding horses and encouraged civilian breeders. The remount stud was replenished by 98 stallions, which are in demand far beyond supply. This corps also completed a vast amount of work upon the cemeteries of our soldiers in Europe. Marble crosses and Stars of David have been placed upon the graves. With the completion of the erection of headstones all ceme-

teries will have been practically completed. Fifty-two bodies in registered graves heretofore carried as "Unknown" were identified, seventy-nine bodies of those who were missing or unlocated were recovered, and twelve bodies were returned from France for shipment to relatives during the year.

Salvage and Land Sales.—The disposition by sale of accumulations of salvage property within the army by this corps for the fiscal year 1928 will approximate a return to the government of $643,268.57. This includes the sale of garbage, manure, dead animals and waste material. No funds were expended in connection with these activities. During the year 8,555.18 acres of land and many buildings were sold for a total sum of $3,116,374.83, the net proceeds to be deposited in the Treasury of the United States to the credit of the Military Post Construction Fund. 722 buildings were salvaged and the material contained therein used for repairing other buildings at the posts and stations.

THE AIR CORPS

Relief Work.—Organizations of the First and Second Corps Areas cooperated with the Red Cross and other agencies in the relief of the stricken inhabitants of the flooded areas in Vermont. For this work a special Air-Ground Panel Code was devised and effectively used in communicating with isolated villages where landing fields were not available. This code has now been adopted by the American Red Cross for universal use in any future emergency of this nature.

Maneuvers and Flights.—The Air Corps in its demonstrations at maneuvers flew 74 planes over 4,000 miles without a casualty or accident to aircraft. The 296,000 miles thus flown across country without mishap is doubtless an unparalleled record, and should give an impetus to the work of flying any heavier-than-air machines. This record is typical of the contribution the Air Corps is making to the safety of flying in general. Last year it flew planes 182,903 hours, or over 18,000,000 miles, with but 27 fatalities, 677,400 miles to each fatality. In 1927 there were 43 fatalities while only 140,000 hours were flown, or 327,600 miles per fatality. In other words, there has been over 100 per cent improvement in the number of flying hours and miles per fatality. In 1921 the Air Corps suffered 73 casualties, although it flew only 77,359 hours; in other words, a casualty for every 1,059 hours flown. The Assistant Secretary of War for Air has been present at the dedication of civilian airports, helped to draft legislation for the promotion of civil aeronautics and cooperated with the Department of Commerce in fostering and developing air commerce. During the year the Patents and Design Board, of which he is a member, handled 228 cases submitted by inventors.

Air Races.—The Army Air Corps entered three teams in the National Balloon Race in Pittsburgh, May 30, 1928. The Army balloon piloted by Capt. William E. Kepner and Lieut. William O. Eareckson, aide, won first place. The race was held under extremely unfavorable conditions and the victory of an army balloon in competition with a large number of experienced civilian balloonists is a tribute to the high degree of training of the Air Corps in free ballooning. The Army Air Corps sent 7 pursuit, 11 observation, 3 transport and 1 photo airplanes to the National Air Races at Spokane, Wash. The Liberty Engine Builders Trophy was won by a Curtiss X013A equipped with wing radiators and the Curtiss V-1550 engine at 170.156 m.p.h. The Air Corps placed first and second in the Free-for-All Pursuit Race in competition against navy and marine corps airplanes.

Survey Work.—The corps itself last year photographed some 30,000 square miles of the United States for the Geological Survey, River and Harbor work, Coast and Geodetic Survey, International Water Commission and International Boundary Commission.

SCIENTIFIC SERVICE

The Signal Corps.—During the year the Signal Corps Radio Labora-

tory at Wright Field, Ohio, developed a new radio receiver for use with aircraft radio sets. This instrument is considerably lighter in weight, occupies less space, is rugged and will receive continuous wave signals as well as tone modulated and radio telephone. It should contribute to the success of signal communications involving aircraft. Another important contribution to aircraft radio operation has been the joint development by the Signal Corps and the Air Corps of a double-voltage, direct, engine-driven generator, for use in aircraft. It eliminates the necessity of supplying a dynamotor with each radio set and effects a saving in weight and cost; it also increases the dependability of operation. Another notable radio achievement has been the re-design and improvement of the 500 watt, crystal controlled, high-frequency transmitter. High-powered radio transmitters of the latest type for communication with airplanes were installed at the following points: Dryden and Marfa, Texas; Deming and Lordsburg, N. M.; Tucson, Arizona; Fort Eustis, Va.; March Field, Cal.; and Yuma, Arizona.

The operation of the Washington-Alaska Military Cable & Telegraph System has shown an increase in traffic handled, in useful service to the territory in net receipts from commercial business, and in economy of operation. New stations were opened at Dillingham on Bristol Bay and at Squaw Harbor, off the southern coast of the Alaska Peninsula, to handle the business of the salmon canneries in those regions, each group of which maintains its own radio station and delivers its business to Signal Corps stations for transmission to the United States. A radio station was established at Point Barrow, this being now the most northerly radio station in the world. The entire volume of press dispatches from thirteen newspapers published in Alaska comes over the Signal Corps system. The War Department Message Center, operating the Army Radio Net, has, in the past year, shown a total net saving to the government of $263,312.76. Three hundred thousand messages containing thirteen million words were handled by the army stations. Forty-eight Federal establishments availed themselves of this free service over the Signal Corps system.

The Chemical Warfare Service has made a fuller contribution to eradication of vermin and pests in boats and warehouses, to the destruction of the boll-weevil and to protection against chemical agents in 1928 than ever before (See AMERICAN YEAR BOOK for 1926 and 1927). Outstanding this year have been developments in the improvement of rubber and protective devices for men and beasts.

TECHNICAL SERVICE

The Ordnance Department operates to design, procure, produce, inspect, store, preserve, maintain and supply ordnance materials of arms, ammunition, bombs, grenades, pyrotechnics, tractors, tanks and trailers. Obviously it would cost the country billions of dollars to have the arsenals under this department's control perform these services for a complete supply of such materials to cover a major emergency when much of the industry of the United States must be turned from regular activities into the production of ordnance. In the meantime there should be sufficient war reserves on hand to allow such change to be made. At present the war reserve stocks are diminishing, because of lack of funds. The Department consequently is having plans so set with commercial firms that the disturbance to industry and the country in the transition period will be at a minimum. Its organization of Ordnance Districts with eminent civilian business and technical men as Reserve Officers is producing the maximum of practical planning. With this work have moved along many improvements in rifles, semi-automatic rifles, aircraft machine guns, anti-aircraft machine guns and mounts, infantry auxiliary weapons, tanks and cross-country transport.

The Infantry has devoted increased study and experimentation to the projection of smoke to facilitate and accelerate infantry advance on the battlefield. The experiences of war have

taught that a blanketing fog renders great assistance to the attacker because of the decrease in effectiveness of opposing weapons. If an artificial fog can be produced and placed so as to decrease the effectiveness of hostile weapons, the advance of friendly troops is permitted without excessive loss. Aerial smoke bombs and smoke curtains, smoke shells for 37-mm guns, and a specially developed smoke apparatus for tanks were tested during the year. Although all are effective under certain circumstances, the difficulty of correctly placing smoke from airplanes and the large amount of 37-mm gun shells required to produce a smoke screen indicate that these methods are in need of further development. The smoke apparatus for tanks has shown promise. The study and development of means of infantry defense against low-flying airplanes has made important progress. Courses of fire for training riflemen and automatic-riflemen have been worked out, approved, and will shortly be published. The usefulness of these courses of instruction has been amply demonstrated during the experimental stage. Eight men of average intelligence and marksmanship were required to fire on towed targets; the result was 53 hits. After taking the courses prescribed, consisting of 21½ hours of instruction, this same group of riflemen registered 101 hits. A second period of instruction of 11 hours increased the efficiency to 132 hits. The mobile anti-aircraft mount for the caliber .30 machine gun was further developed, and promises to fill all infantry needs in fire both against ground targets and aerial targets up to 2000 feet. Tests of semi-automatic shoulder rifles indicate the practicability of an eventual replacement of the present magazine rifle with a semi-automatic rifle.

Increased study has been directed to the motorization of infantry. A number of cross-country vehicles, suitable as carriers for cargo, personnel, and auxiliary infantry weapons, have been developed and tested. Plans were drawn for testing the advantages of equipping an infantry regiment with the latest motor vehicles. The tests will probably take place during 1929. Rapid progress has been made in tank design and development. The medium tank of twenty-three tons was tested; it showed promising characteristics, but was, in general, believed to be too heavy. Further development will aim for a medium tank of fifteen tons weight. A new light tank, developed during the year, has lighter weight, greater fire power, increased speed (22 miles per hour), radius of action, and dependability. Along with tank development have gone studies in the development of anti-tank weapons. Important tests are now in progress to determine the characteristics of a gun, or guns, which will afford means for protection of infantry against tanks. Progressive improvement in practice with infantry arms has been manifested. Of 21,660 men firing the rifle, 19,716 (91.02%) qualified. Of 5,764 men firing the machine-gun, 5,613 (97.38%) qualified. Of 638 men firing the 37-mm gun and 3-inch trench mortar, 631 (98.9%) qualified.

The Cavalry has been reduced in peace strength during the year, with a reduction in organization overhead, the incorporation of a machine gun troop in each regiment, and the reduction of rifle troops from six to four. Notwithstanding the smaller size of the new regiment, its fire power is greatly superior to that of the old, although its mobility is in no way impaired. The elimination of wire within the regiment, the substitution of cross-country cars for motor-cycles, and the addition of trucks to the headquarters troop have all tended to increase the regiment's mobility and radius of action. Two types of armored cars have been constructed for the armored car troop, which now forms a component part of the cavalry division. The peace organization has permitted the cavalry to operate efficiently in an emergency and to facilitate its prompt transition to war strength. The new war organization has been tentatively approved, effective July 1, 1929. This organization embodies improvements and developments in fire power and motorization

while adhering to the principle of increase in fire power without impairment of mobility.

The Field Artillery.—With the knowledge that little, if any, equipment developed during a war is produced in any quantity during that war, the Field Artillery has considered as one of its paramount peacetime missions the cooperation with the supply departments in the development of the best equipment possible for standardization and quantity production at the outbreak of war. An improved 75-mm, split-rail, gun and a 75-mm pack howitzer, carried in six loads, both with greatly increased ranges, and a 105-mm split-rail howitzer, have been developed by the Ordnance Department, tested by the Field Artillery, and standardized by the War Department. Designs for a 155-mm howitzer, a 155-mm gun, and an 8-inch howitzer have reached a stage where the weapons could be manufactured in an emergency. These latter weapons, however, due to lack of funds, have not been sufficiently tested or standardized. Commercial tractors and other motor vehicles are being continuously tested with the result that tractors for light, medium, and heavy motorized artillery have been adopted as standard. These standards will be changed as it becomes advisable as shown by the continuing tests. No other motor vehicles have been standardized due partly to lack of funds and partly to the rapid improvement in commercial vehicles. The market is being watched, however, and tests made whenever possible.

The art of horsemanship has been kept alive and possibly improved due to the ever-present need of horse traction in division artillery and to the great animal resources of our country. An increasing amount of emphasis is being placed on draft at the Field Artillery School and in the arm in general. Two field artillery officers were participants in the recent Olympic Games, the National Horse Show at Madison Square Garden, and the International Show at Toronto, as members of the U. S. Army Equestrian Team.

Coast Artillery Corps.—The year has seen a marked rise in effectiveness of anti-aircraft artillery, through new designs of arms, range-finding instruments and ammunition. Searchlights used to illuminate airplanes for fire by the gun batteries are directed by sound locators (or long horns); the year has seen the development of electric connection of horn and light so that movement of the horn results in movement of the searchlight, and of an ingenious correction device interposed between horn and light to compensate for ballistic factors affecting sound. Anti-aircraft artillery is now surprisingly effective. During the year, battle practices have been held for the first time since the World War, consisting in the simultaneous fire of all the batteries of the seacoast fortification concerned, simulating action against a fleet. A competitive rating of batteries in the Coast Artillery Corps has stimulated effort towards increasing hits per gun per minute, at long ranges. A new, effective and economical system for the control of submarine mines was adopted.

The Adjutant General's Department.—The Adjutant General as the administrative officer of the War Department handles, through his office, a voluminous correspondence with agencies of all kinds, including military forces in the field, other branches and bureaus of the government, members of Congress and the public generally. During the fiscal year ended June 30, 1928, a total of 2,949,984 pieces of mail were received and disposed of. More than half of this total consisted of correspondence requiring written answers, the remainder being mostly reports of various military activities, which, while not requiring written replies, did require a vast amount of detail work before they could be filed for future reference. All correspondence between the War Department proper, as represented by the Secretary of War, and the multitudinous military activities of the army finds its way to and from the War Department through the channel of the Adjutant General's Office, where proper records are made

in each case, and in all, save exceptional matters which necessitate action by the Secretary himself or some branch of the General Staff, administrative action is taken. The office is so organized that this tremendous volume of business goes on with practically no interruption.

The Finance Department is the agency through which the War Department pays its personnel and bills and audits the property accounts of its officers. The Chief of Finance is the Budget Officer of the War Department. In its work the Finance Department has uppermost the idea of savings for the government. As most commercial invoices (the Finance Department handled 466,019 during the past fiscal year) feature a definite period and show the exact date to which a discount is limited, the fullest advantage has been taken by the Finance Department for such deductions. Through the method of prompt payments it maintained business contact with commercial firms and individual merchants on a cash basis. Expeditious payments have been the main factor in the Department's successful operation as a government agency in meeting all bills incurred by the War Department. 808,086 public vouchers were thus paid last year, either in cash or by check on the Treasurer of the United States: in all 1,406,588 checks were drawn against the Treasury. The discounts earned were $303,912.07. Since 1920, when all payments have practically been reduced to a cash basis the Finance Department has saved to the government $2,377,044.99 in commercial discounts.

The army encourages its soldiers to save their money by making deposits with the Finance Department in sums of $5.00 and over. At the end of their enlistment they receive the total, plus 4 per cent interest per annum. In view of the small pay, ranging from $21.00 to $157.50, such effort seems at first impractical. Yet, when it is considered that board and room and clothing, the chief items of expenses of any man, are furnished free to the soldier, and that the cash amount he receives is his to spend for incidentals, a tidy little sum may be saved during a three years' enlistment which will come in very conveniently if the soldier elects to stay out of the service. If he elects to reenlist, he may re-deposit the money, and lay the foundation for a good savings account. The cases of enlisted men retiring after thirty years' service from the army with sums above $5,000 are not rare. The records show that the largest credit to a depositor is $11,000 at this writing. During the last year 7,991 soldiers deposited $1,257,663.95 and received in interest $27,116.32. The records in the Office Chief of Finance show that from June 30, 1873, to June 30, 1928, $66,472,907.17 were deposited, earning in interest $3,776,084.51 during the same period. The contribution to general welfare of hundreds of soldiers, thrifty, upstanding, clean and disciplined, sent out into the life of communities over the United States every year is a vast asset to the country often overlooked. This phase of the army's place as a training school for any pursuit must be considered as a large return to the public, from War Department appropriations.

The Judge Advocate General's Department conducts many cases for the government outside military investigations and trials. The Judge Advocate General, as legal adviser to the Chief of the Bureau of Insular Affairs, represents our Insular Governments, their political divisions or officers in cases brought up for review from the Supreme Court of the Philippine Islands, the Supreme Court of Porto Rico, and the United States District Court for Porto Rico. In the Supreme Court of the United States there were pending on Jan. 1, 1928, 5 cases; up to Nov. 14, 1928, there were received 11 new cases, a total of 16. In the United States Circuit Court of Appeals, First Circuit (Boston), there were pending on Jan. 1, 1928, 30 cases. Up to Nov. 14, 1928, 18 new cases had been received, a total of 48 cases of which 35 have been disposed of. Some of these cases were of the greatest importance to the Insular Governments, involving particularly questions of organization

and form of government of the Philippine Islands, the powers of the Governor General and the Legislature. Those of the Porto Rican Government involved the validity of tax legislation upon which a large proportion of the revenue of that Government depended, and a variety of other questions, among them the validity of its coffee and tobacco inspection laws and the scope of the power of the Insular Public Service Commission.

The Civil Affairs Section handled the preparation of cases for the Attorney General and the Court of Claims in suits in which the War Department or some branch thereof was concerned. The amounts involved over $80,000,000 in suits against the government. Thirty-five such suits are pending in the United States District Courts, involving sums aggregating $124,265.82. Forty-two admiralty cases are pending, involving sums aggregating $1,337,-839.60. In suits brought by the United States against war-time contractors and others, 5 judgments aggregating $769,248.36 were obtained. In addition, compromise settlements amounting to $454,488.00 have been negotiated. The patent cases handled by this Department involved over 660 million dollars or, roughly, twice the army appropriation. The saving to the government by army officers of comparatively low salary in handling such litigation would run into many thousands of dollars.

The Inspector General's Department has devoted its main efforts to the inspection of various army activities and economic surveys of installations. Its principal intent is to see that the government gets a dollar's worth for each dollar expended, both in material and labor. In this way good features are encouraged and poor ones constructively bettered.

The Medical Department.—Despite the handicap of shortage of personnel, officers of the Medical Department have put forth most commendable efforts to keep abreast of the progress being made in their professions. Through research and experimentation, members of the Department have year after year been making signal contributions to the promotion of public health. The past year has proved no exception. Some of the noteworthy researches made were studies at the Army Medical School on some of the problems regarding amoebic dysentery, on the best method of sterilizing drinking water in the field, on the ultra-violet content of winter sunlight in Washington as a guide in the construction of solaria, and investigations undertaken by the Medical Department Research Board in the Philippines with special attention to beriberi, rinderpest, and surra. The two latter diseases are animal scourges of which rinderpest alone during the past 40 years has caused the premature death of hundreds of thousands of animals, notably the carabao, the principal beast of burden in the Philippines. In many parts of the world scientific investigators have been devoting their energies to the development of more efficient curative and preventive measures aganist these animal diseases. Through work just concluded by the Medical Department Research Board, it is believed that a practical way has been discovered for effectively controlling rinderpest. The economic aspects of any scientific work which will bring about beneficial results of this character need not be stressed. While performing this service, the Department has brought down the venereal and death rates in the service to lower figures, has lessened preventable diseases such as malaria, and increased the health of the army.

The Militia Bureau.—The Constitutional obligation upon Congress to organize, arm and train the National Guard is carried out by laws which appropriate certain sums in the nature of "Federal aid" to be expended through Federal agencies in the states. In return for this aid the states obligate themselves to care for government property issued to the National Guard, to account for monies, and to maintain their forces at the standards of efficiency prescribed. Determination of a state's fulfillment of its obligation is made by inspections by Regular Army officers. The reciprocal relationship existing be-

tween the state and Federal Government is administered through this Bureau, whose chief is a National Guard officer holding a commission in the Officers' Reserve Corps of the army. Under this system the National Guard, at the end of the fiscal year 1928, had an authorized strength of 186,260, which was divided among 3,924 organizations located in 1,457 separate cities and towns throughout the United States, Porto Rico and Hawaii. The present approved program for development of this force calls for a strength of 188,000 in 1929 and 190,000 in 1930. The present modified program provides for an ultimate strength of 250,000.

The training of these state forces is supervised by officers of the Regular Army and consists of a minimum legal requirement of 48 drill periods yearly, each of not less than one and one-half hours' duration, in addition to fifteen days of field training in encampments or on maneuvers. For these drill periods, compensation is provided from the Federal appropriations for each drill attended by officers and men at approximately one-thirtieth of the monthly pay for like grades in the Regular Army, while compensation for the fifteen days of field training is the same as for the Regular Army. Authority also exists for the attendance of officers and enlisted men at various Regular Army service schools. Since 1920, 2,016 officers have received instructions at these schools and the number admitted is only limited by the availability of funds. Authority also exists for the detail of National Guard officers for duty in the Militia Bureau and on the War Department General Staff, both for the purpose of giving instruction to the National Guard officers and to bring to the consideration of important policies the viewpoint of the citizen-military forces. The citizen-military system under the amended National Defense Act has, since 1920, developed in the country a potential Federal force of 18 Infantry Divisions, 4 Cavalry Divisons, 18 Regiments of Corps Artillery, 8 Regiments of Anti-aircraft Artillery, 15 Regiments of non-divisional Infantry, and 14 regiments and 5 battalions of Coast Artillery. Although all of these organizations are not completely organized they are sufficiently organized, armed and trained at the present time to perform any duties which from time to time may devolve upon them in the service of the states, and are considered by military authorities to be ready to perform limited military missions on short notice in the service of the Federal Government.

The Chaplains' Corps.—The total number of religious services conducted on military reservations during the fiscal year was 18,890 at which 1,777,018 persons worshiped. This includes 2,523 services conducted by civilian clergymen. The above figures do not take into account the large attendance of military personnel at services in churches near their stations nor does it include all of the services conducted by chaplains of the Organized Reserves and National Guard in summer training. The high standards established for clergymen in civil life obtain as the basis for judgment of military clergymen.

The Bureau of Insular Affairs is the agency through which the War Department looks after the interests of the Philippine Islands and Porto Rico and is its representative before the executive departments and the public in matters concerning those islands. The Philippines have enjoyed a period of good business without any of those physical catastrophes which retard, from time to time, progress in the tropics. Conditions relative to health and sanitation have steadily improved. There has been made a careful survey of the school activities by a commission of experts headed by Dr. Paul Monroe, of Columbia University. The recommendations made by the commission have been carefully studied by the executives charged with the conduct of education in the islands and by the legislature. Naturally, agriculture continues to be the principal source of wealth. During one year of this 4-year period, for the first time in their recent history, the Philippine Islands

produced sufficient rice for home consumption. It is the result of educational effort over a period of 25 years. In 1903, 30 per cent of the imports of the Philippines, in value, consisted of rice; in 1927 but 1 per cent consisted of rice. During this same 4-year period there has been a great growth in the coconut industry. Coconut products have competed with sugar for the lead in exports from the Islands. Exports of coconut oil and copra now are about equal in value, while desiccated coconut has become an important item of export trade. The customer who purchases for the oil mills in the Islands competes with the purchaser of copra for export to mills in the United States and elsewhere.

During the past fiscal year the floating debt of Porto Rico has been reduced by $1,200,000 and on July 1, 1928, approximated $2,000,000, a reduction of $3,025,000 in a period of four years. The reduction might have been greater, but the legislature of Porto Rico was averse to any considerable reduction in the budget of expenditures. The taxpayers of Porto Rico, on the other hand, were strongly opposed to any material increase in taxation. These considerations necessitated a somewhat slower reduction of the public debt than appeared desirable on the sole basis of sound finance. It is now thought that the new capitol will be ready for occupancy by the legislature at its next session, in February, 1929, although it is not expected that the edifice will be fully completed for several years. The new asylum for the insane is in the final stage of completion and could be occupied, if necessary, before the end of the present calendar year. Construction of the penitentiary is somewhat less advanced. The hospital, forming a part of the School of Tropical Medicine, is now completed and in interior arrangement is a model for the practical work to which it is devoted. The road program of Porto Rico, which contemplated the construction of 2,000 kilometers of first-class macadam with asphalt surfacing has been carried out. The island has been provided with a good road system, adequate for an area of 3,600 square miles.

The Bureau has immediate supervision and control of the Dominican Receivership for the collection of customs revenues and payment of the interest and principal of the adjusted bonded indebtedness of the Dominican Republic.

PANAMA CANAL

The Panama Canal, while not a part of the War Department, is under the personal supervision of the Secretary of War, and its present Governor is Col. Harry Burgess, Engineer Corps, U. S. Army. From the opening of the Canal to commerce on August 15, 1914, up to June 30, 1928, a total of 46,833 commercial vessels with an aggregate Panama Canal net tonnage of 204,136,588 has been transited. The gross transit revenues of the Canal to June 30, 1928, including tolls, taxes, licenses, fees, and postal receipts, amounted to $196,257,966.49. The net corresponding expenses, excluding interest on the investment, totaled $104,028,-845.36, leaving a net surplus of $92,-229,121.13. In addition, for the same period the business operations comprising the furnishing of various services and supplies to outside interests, mainly to shipping, showed a net surplus of revenues over expenses amounting to $6,686,318.69. As compared with the fiscal year 1927, the number of vessels using the Canal during the fiscal year 1928 (exclusive of public vessels of the United States and other ships exempt from the payment of tolls) increased from 5,475 to 6,456; and gross revenue from tolls rose from $24,228,830.11 to $26,944,499.77, an increase of $2,-715,669.66. The net revenue from canal transit operations during the fiscal year 1928 was $18,224,844.86 and from canal business operations $736,719.43, as compared with $15,-611,093.80 and $876,536.80 during the fiscal year 1927.

OTHER ARMY AGENCIES

The Civilian Personnel Division, under the direction of Assistant and Chief Clerk John C. Scofield, exer-

cised administrative control in matters pertaining to civilian employees in the War Department and with the army. This task involved the administration of the Civil Service Law and rules, the Reclassification Act, the Retirement Act, the Eight-Hour Law, and the Employees' Compensation Act. This division also handled matters affecting salaries and wages. The number of civilian employees affected by the foregoing laws in the Department and its field services at this time is 46,244.

The Corps of Engineers covers a wide field in contribution to the welfare of the United States. Besides its work on rivers and harbors, the officers of the Corps design and build fortifications, improve engineering equipment, carry on surveying and mapping, contribute from their personnel to civil positions and instruct and train nearly 17,000 officers and enlisted men of the National Guard and Organized Reserves. For performing these varied tasks there are but 538 officers and about 4,500 enlisted men, all of whom, in addition, are kept in training for our national defense. During 1928, engineer troops accomplished the mapping of something over 1,000 square miles of territory in the United States, all of which will be published in maps available to the public and of large economic value to the nation. In order to publish maps required for military purposes, a lithographic reproduction plant is operated. This plant is capable of doing a large amount of miscellaneous reproduction work and does so for many Government agencies at a considerable saving in funds to the government. This Corps cooperates with the Air Corps in the development of aerial photographic equipment.

During the year 1928, much progress was made in the construction of major armament installation for seacoast defense in the Panama Canal Zone and in the development and test of anti-aircraft searchlight equipment. In addition to the large number of officers of the Corps employed on river and harbor improvement, there are several who are detailed to other civil activities; notably, three with the Panama Canal Civil Government, four on duty with the civil government of the District of Columbia, three with the Federal Power Commission, three with the American Battle Monuments Commission, six with the Alaska Road Commission and river and harbor duty in Alaska, one with the Arlington Memorial Bridge Commission, and two with the office of Public Buildings and Public Parks, National Capitol.

WATERWAYS AND HARBORS

By Edgar Jadwin

Major General, U.S.A.; Chief of Engineers, War Department

INLAND WATERWAYS

Location and Description.—The principal systems are the Great Lakes, with the New York State Barge Canal and the Hudson River; the Mississippi system, including the Mississippi, Missouri, Ohio, Illinois to Chicago and their important tributaries; Atlantic Coast rivers and intracoastal waterways connecting them; Gulf Coast rivers and the intracoastal waterway system running from Mobile down the Texas coast, connecting with the numerous southern Louisiana waterways and the Mississippi system; the San Joaquin—Sacramento system in California; the Columbia system in the Northwest; and the minor Pacific coast rivers. These are improved over stretches and to depths commensurate with their commercial importance. The Great Lakes have connecting channels from Superior to Erie at least 21 feet deep at standard low water, and corresponding depths are provided at the most important harbors. The New York State Barge Canal, and the in-

tracoastal system from Trenton, N. J., to Wilmington, N. C., have 12 feet. The Mississippi has 9 feet to St. Louis, and 6 feet to St. Paul; the Ohio, a 9-foot project, with 6 to 9 feet on its main tributaries; the Missouri, a 6-foot project to Sioux City, and the Sacramento a 10-foot project. Various other rivers and waterways range from 7 feet or more to 3 or 4 feet, and those of small importance often have no specified project depth, and are improved simply by the removal of snags and obstructions. The above figures give the *project* depths toward which the War Department is working.

Commercial and Economic Importance.—The corrected total of inland waterway commerce for 1927 was 219,000,000 tons valued at $3,930,000,000. The total waterborne commerce of the United States was 532,500,000 tons, valued at $25,555,000,000. Rough estimates indicate that the direct benefits to the public, in the single item of reduced transportation charges on freight actually moving by water, and disregarding all ulterior benefits, are sufficient to pay about every two years the entire sum spent on all improvements from the beginning.

Status of Water Transportation.—Inland waterway transportation, after a widespread decline coincident with the development of railroad facilities throughout the country, has in the past ten or fifteen years shown a pronounced increase. In recent years there has been an increase of about 75 per cent in the business handled on inland waterways and an equal increase in the domestic trade of ocean ports. The pronounced trend toward a more extensive use of waterways is due, among other causes, to the realization that under suitable conditions as to character of traffic, origin and destination with respect to waterways, suitable channels, and modern carriers and terminals, water transportation is cheaper than any other. Waterways are particularly valuable in the handling of raw products and low grade commodities for which the economic necessities of the country demand lower transportation costs than railroads can afford. The three means of internal traffic,—railroads, waterways and highways,—are properly coöperative rather than competitive, and the development of each of them is not only of benefit to the public at large but also to all transportation agencies, thus requiring cooperation of the railroads in the establishment of equitable joint rates. There is also a distinct tendency toward providing modern and efficient carriers, terminals and trans-shipment facilities.

In no section of the country is this more evident than in the Mississippi Valley. The Mississippi up to Cairo has been served for several years by the Inland Waterways Corporation, and this service has now been extended to St. Paul and Minneapolis. On the upper sections of the Ohio system there has long been intensive traffic, such as the coal movements on the Monongahela, Allegheny and Kanawha and the Ohio itself. With the approaching completion of the river improvement, whereby it will be tied to the Mississippi with a year-round 9-foot channel, the great steel companies of the upper valley are spending large sums for new floating plant, and are increasing their shipments by way of the river. There is also a growing demand for the establishment of additional efficient common carrier service on the Mississippi and its tributaries, as well as on numerous other important waterways throughout the country.

Inland Waterways Corporation.—This was created June 3, 1924, by an act of Congress. It represents a reorganization of the Federal Barge Line created during the war, and in its present form is a corporation functioning like any other, but controlled by the Government through the Secretary of War. The present chairman and executive officer is Major General T. Q. Ashburn. It has for some time been operating a fleet of modern barges and tow-boats on the Mississippi River from New Orleans to St. Louis, on the Warrior River in Alabama, and over the intermediate intracoastal waterways, and the service on the Mississippi was recently ex-

tended to St. Paul and Minneapolis. It handles freight of all kinds—low, medium, and high grade. Operation of the barge line since the close of the war has not, until recently, resulted in a material direct return on the investment. The reasons are many, but essential equipment was lacking and joint rates with connecting railroads were not existent. Conditions are constantly improving, particularly in the rate situation. During the calendar year 1927, the corporation handled 1,650,033 tons of commerce, of which 1,251,339 tons pertained to the Mississippi Division and 398,694 tons to the Warrior Division. The net results to the people of the United States up to the present are the salvaging of a potential war loss of some $7,000,000 and an annual saving in freight rates of more than a million dollars.

NEW WATERWAYS PROJECTS

Reports and Plans.—By the act of January 21, 1927, Congress adopted 24 projects for inland waterway improvement, besides 9 for Great Lakes Harbors. These include both new projects and the extension of existing ones. Among the important projects adopted are those for a 9-foot channel in the Mississippi River from Cairo to St. Louis; for a 6-foot channel in the Missouri River from Kansas City to Sioux City; for a 9-foot channel in the Illinois River from its mouth to Utica; and for the extension from Beaufort to Wilmington, N. C., of the 12-foot Atlantic intracoastal waterway, of which Beaufort had previously been the southern terminus. During the fiscal year 1928, the Corps of Engineers completed and submitted to Congress 130 reports on proposed new projects for inland waterways. Of these, 51 reports were favorable for improvement, and 79 were unfavorable.

Mississippi Flood Control.—By the Act of May 15, 1928, Congress adopted the plan of the Army Engineers for the control of floods in the Mississippi Valley. This plan is definite and comprehensive, and it differs in engineering principle from those used in the past. It projects against the greatest flood predicted as possible by experts. The flood channel has in the past been so restricted that the river is no longer able to carry within existing levees a flood of the size of that experienced in 1927, or floods of greater magnitude which may occur. The new plan provides that the river shall be restricted less. In general terms this will be done by allowing the flood waters to use parts of natural lateral flood channels in critical sections, by moderate raising and considerable strengthening of the main line levees, and by a spillway above the city of New Orleans for the protection of that place. The amount authorized to carry out the project is $325,000,000, used at a probable rate of about $30,000,000 a year.

Flood Control Elsewhere.—In addition to flood control for the Mississippi Valley, investigations and surveys have been authorized for other streams throughout the United States to determine the advisability of flood control improvements as well as works for navigation, water power and irrigation. The Army Engineers are making these investigations and surveys and it is probable that some of the reports will be transmitted to the final session of the Seventieth Congress.

Major Development Proposals.—The following major proposals for new or extended inland waterways developments are now up for study, recommendations thereon not having been formulated: deepening the Mississippi River channel from the Missouri River to Minneapolis to 9 feet; deepening the Missouri River channel from Kansas City to its mouth to 9 feet; barge canal between the Ohio River and Lake Erie; 40-foot channel in the Delaware River from Philadelphia to the sea; barge or ship canal across New Jersey from the Delaware River to New York Harbor; extension of the Atlantic intracoastal waterway from Cape Fear River, N. C., to St. Johns River, Fla.; extension of the Gulf intracoastal waterway from Corpus Christi to Point Isabel, Tex., and deepening the Houston Ship Channel, Tex., to 32 feet.

PORTS

Major Ports.—The principal ports of commercial importance are: New York, the major port of the nation, handling nearly 25 per cent of our foreign commerce, and especially notable as the principal port for the foreign and coastwise movement of high grade package freight: Portland, Me.; Boston, Philadelphia, Baltimore, Norfolk and Newport News.

In the South Atlantic are Wilmington, N. C., Charleston, S. C., Savannah and Jacksonville, with a growing general commerce in some cases, but specializing on bulk commodities. To these should perhaps be added Miami, a coastwise port whose channel is not fully deepened, but which has made tremendous progress with the growth of the State of Florida.

Major Gulf ports include New Orleans, with a very large general commerce; Houston, Galveston and Texas City, with a large commerce in grain, petroleum products, cotton and other commodities; the Sabine ports, primarily oil shippers; and Mobile. The major Pacific ports are Los Angeles, San Francisco, Portland, Ore., Seattle and Tacoma. Los Angeles has developed a tremendous commerce; most of its tonnage is local outbound oil and inbound lumber, but general cargo is increasing. The others are ports of general commerce.

Secondary northeastern ports include Providence and the other southern New England ports, whose principal commerce is inbound coal, lumber and petroleum products, and coastwise miscellaneous traffic with New York.

Other South Atlantic and Gulf ports include Fernandina, Tampa and South Boca Grande, fertilizer shippers; Freeport, Tex., a sulphur shipper; Key West, primarily a car-ferry port; the new port of Corpus Christi; Brunswick, Pensacola, Pascagoula, Gulfport, and others.

The secondary ports of the Pacific include San Diego, several California oil ports, and the lumber ports of the northwest.

Channel Depths.—Of the major ports a few have channels with improved depths as great as 40 feet. These are for special traffic, such as the largest Atlantic and Pacific liners and the largest oil tankers. In general, the standard depth being provided and maintained for ports of general commerce is 30 feet at mean low water. This is ample in nearly all cases. Statistics show that of the commercial vessels passing through the Panama Canal about 95 per cent drew less than 30 feet, and the same general rule applies for the shipping of the world. Smaller ports handling a coastwise business primarily are being maintained at depths of from 18 to 25 feet, and the numerous fishing ports, or ports on sheltered waters, such as Chesapeake Bay, often have channels of 12 feet or less.

New Port Projects.—Including new projects and extensions of existing projects, there were adopted by the River and Harbor Act of January 21, 1927, 18 new projects for improvement at ports. Among these is the authorization of a 40-foot channel to Newport News, Va. (now about one half completed), a 26-foot channel to Stockton, Calif. (on which only preliminary work has been done), and provision for the purchase of the Cape Cod Canal, which was taken over by the United States April 1, 1928, and now provides a safer passageway, free of tolls, in a locality very dangerous for vessels. During the fiscal year 1928, 24 reports on proposed port projects were submitted by the War Department to Congress. Of these 18 were favorable for improvement and 6 were unfavorable.

Port Facilities.—The post-war period has been one of great activity in port organization and port development. The Army supply bases built at Boston, Newark, Brooklyn, Philadelphia, Norfolk, Charleston and New Orleans have been leased for commercial shipping, except for reservation of sufficient space for military needs. The dry docking and repair facilities provided for the Emergency (now Merchant) Fleet have also proved of great value to merchant vessels, particularly on the Atlantic and Gulf coasts, where some ports were previously without such facilities.

The Port of New York Authority,

formed jointly by New York and New Jersey and sanctioned by Congress, after extensive investigation, is now engaged in carrying out plans for the comprehensive development of the port of New York and the coördination of its rail and water facilities. The plans contemplate the construction of an outer, a middle, and an inner belt line and an automatic electric system. The middle belt line is designed to provide the shortest connecting link between all railroad lines, connection between the belt line on the west side of the harbor with that on the east side being made by a tunnel to be constructed beneath the bed of the Upper Bay, between Greenville, N. J., and Bay Ridge, Brooklyn. An essential part of the plan consists of many belt lines to promote and serve industrial developments and water fronts. Several years will be required to design, construct, and install the complete system. To afford relief in the meantime, it is proposed to establish motor-truck service between the railroads of the port district and Manhattan. Port Newark has increased the facilities of New York Harbor by the development of ocean terminals, and further extension will be provided when a project at Jamaica Bay has been completed.

Philadelphia and Other Ports.—Commodious piers have been added to the well-equipped waterfront of Philadelphia. The facilities at Norfolk have been extended by the construction of coal loading piers of great capacity and high efficiency, of other wharves, and of a large grain elevator. Wilmington, Del., has completed a modern terminal capable of docking several ships. Notable waterfront activity is shown at Mobile, Ala., where an extensive program of terminal construction is under way. Miami has also found necessary a considerable expansion of its facili-

FREIGHT TRAFFIC THROUGH WATERWAYS UNDER IMPROVEMENT (1927)

Waterways	Short Tons	Value
Hudson River, middle stretch	8,339,326	$ 99,570,371
Hudson River, upper stretch	1,481,987	101,783,725
Delaware River, above Philadelphia	5,733,890	17,530,098
Chesapeake-Delaware Canal	608,466	44,443,481
Waterway from Norfolk, Va., to the Sounds of North Carolina	154,873	3,313,689
Inland Waterway from Norfolk, Va., to Beaufort Inlet, N. C.	650,048	23,334,547
St. Johns River, above Jacksonville	290,568	14,520,201
All others, Atlantic Coast	10,448,401	322,690,482
Tombigbee-Warrior System	1,491,265	28,869,447
Southern Louisiana Waterways (excluding Mississippi River)	2,488,158	50,972,608
All others, Gulf Coast	2,200,256	96,100,667
San Joaquin River	1,152,743	51,604,962
Sacramento River	1,209,870	78,616,610
Columbia River and lower Willamette between Vancouver and Portland	7,768,399	62,972,813
All others, Pacific Coast	11,978,595	110,854,568
Mississippi River, below Vicksburg (excluding ocean commerce)	4,645,578	203,682,550
Mississippi River, Memphis-Vicksburg	4,358,097	213,025,604
Mississippi River, Cairo-Memphis	2,144,317	126,507,317
Mississippi River, St. Louis-Cairo	1,110,402	45,257,625
Mississippi River, above St. Louis	715,110	5,689,682
Ohio River	20,128,518	168,422,904
Monongahela River	25,873,029	135,760,330
Allegheny River	3,860,947	9,010,286
Kanawha River	1,420,776	7,250,931
All others, Mississippi System	11,417,531	131,206,214
Detroit River (through commerce of the Great Lakes)	97,188,281	1,319,816,856
All others in United States	121,975,764	2,230,567,148
Total	253,646,914	$4,383,558,860
Total, corrected for duplications because of commerce moving over two or more waterways	219,000,000	$3,930,000,000

ties. Houston, Tex., once an inland city, has in recent years developed an extensive port on an artificial ship channel, handling a large tonnage of oil, cotton and miscellaneous freight. On the Pacific Coast there has been a considerable expansion of facilities, notably at Los Angeles, where the commerce has increased enormously in recent years. San Francisco, Portland, and Seattle have also found it necessary to provide large additional accommodations for their waterborne traffic. Somewhat less extensive, but nevertheless important, additions to waterfront facilities have been provided at Portland, Me., where a state pier has been built; at Boston, Baltimore, Charleston, Jacksonville, Tampa, San Diego and Richmond, Calif., and Tacoma, Wash., and a new port has been formally opened at Corpus Christi, Tex.

INLAND WATERWAYS AND COASTWISE COMMERCE

Government Improved Waterways.—The table on page 290 shows freight traffic for 1927 of waterways under improvement by the Federal Government, excluding short deep stretches of rivers (like the lower Hudson and Delaware), which are really approaches to ports.

The figure for the Detroit River does not give the entire Great Lakes commerce, much of which (classified as foreign, coastwise or internal) did not pass through that channel. The total corrected Lakes commerce was 140,360,791 tons, valued at $2,313,-139,907.

TRAFFIC THROUGH OTHER INTERNAL WATERWAYS

Waterways	Short Tons	Value
Cape Cod Canal	894,763	$284,786,925
New York State Barge Canal	2,581,892	102,000,000
Lehigh and Delaware Division Canals, Pa	325,545	1,665,349
Chicago Sanitary Drainage Canal	914,847	2,967,356
New Basin Canal, La	508,135	3,858,143
All others of record	1,116,661	68,207,219
Total	6,341,843	$463,484,992

COASTWISE AND INTERCOASTAL COMMERCE

Port	Tonnage, Both Ways	Value
Portland, Me.	2,389,777	$ 86,769,331
Boston	12,778,085	726,567,801
Providence	4,648,197	457,144,193
New York	47,100,439	3,138,850,396
Philadelphia	11,765,689	676,998,845
Baltimore	5,089,979	238,843,501
Norfolk-Newport News	18,730,295	562,121,531
All others, Atlantic Coast	28,919,585	1,697,497,041
New Orleans	2,922,234	179,596,227
Galveston, Houston, Texas City	13,534,774	605,804,260
The Sabine ports	14,110,750	263,603,436
All others, Gulf Coast	8,497,978	222,252,485
Los Angeles	18,344,502	742,727,508
San Francisco Bay and Harbor	22,255,784	1,132,108,305
Portland, Oregon	3,051,429	198,063,362
Tacoma	3,586,491	85,662,475
Seattle	7,336,093	397,310,300
All others, Pacific Coast	13,910,824	258,637,289
Hawaii, Porto Rico, and Alaska	4,147,143	378,737,750
Total	243,120,048	$12,049,296,036
Total, corrected for duplications of "receipts" and "shipments"	121,560,024	$ 6,024,648,018

The grand total of corrected internal waterway commerce in recent years, including only that part of the Lakes commerce passing through the Detroit River, is as follows:

LAKE COMMERCE THROUGH DETROIT RIVER

Year	Tonnage	Value
1920	125,400,000	$2,814,600,000
1921	116,300,000	2,443,500,000
1922	111,800,000	3,177,900,000
1923	153,700,000	2,960,200,000
1924	173,200,000	3,446,000,000
1925	227,704,122	4,237,550,163
1926	243,630,927	4,054,686,858
1927	253,646,914	4,383,558,860

The following gives the total intercoastal traffic of the Canal in recent years:

COMMERCE THROUGH PANAMA CANAL

(Short tons)

(Fiscal years)

Year	Intercoastal	Total
1921	1,372,388	$11,599,204
1922	2,562,527	10,884,910
1923	8,068,553	19,567,875
1924	13,527,378	26,994,710
1925	9,496,259	23,958,836
1926	9,871,210	27,747,541
1927	11,365,592	31,078,000
1928	10,833,443	33,186,395

ORGANIZATION OF THE NAVY

By William Ledyard Rodgers

Rear Admiral, United States Navy

ADMINISTRATION

Shore Establishment. — Although the navy does its work on the sea, it draws its men, ships, and supplies from the land and is directed by the President, who is its constitutional Commander-in-Chief. Consequently, the foundation of naval efficiency lies in a sound organization and administration of the shore establishment of the navy. By authority of the Constitution, supplemented by legislative action, the President delegates his authority to the Secretary of the navy, who, as the Deputy of the President, maintains and operates the navy, according to law and with the money appropriated by Congress. When the Secretary is absent from his post, the law authorizes an Assistant Secretary to sit at the Secretary's desk and operate the navy as the temporary holder of the delegated authority of the President. Like every other business institution, the naval organization must provide for two main tasks. It must maintain itself in efficiency, and it must direct its effort wisely toward the objective for which it exists. In military phrase, the management of maintenance belongs to the Routine Staff; the direction of effort belongs to the General Staff, or as the American Navy calls it, to the "Office of Operations."

Bureau of Navigation.—The maintenance of the navy falls under two heads: (A) Personnel; (B) Material. The Bureau of Navigation deals with all matters affecting the enlistment, discharge, training, administration and discipline of the personnel of the navy. It manages the Naval Academy, the Hydrographic Office, the Naval Observatory and the Naval Home for retired seamen. The Bureau is responsible for training individuals, but not for ship efficiency. Besides the training stations where recruits get their elementary naval training, the Bureau maintains various technical schools for electricians, machinists, torpedo and radio men, cooks, etc. In regard to officers, the Bureau manages the Naval Academy for Midshipmen, who are appointees of the President and of Congress. They are there trained in mathematics and the English branches as well as in the technical arts and sciences pertaining to the navy. Midshipmen are also drilled in the use of the weapons and machinery used on shipboard. The Bureau fixes the proper complements to man each type of ship, assigns in-

dividuals to specific duty here or there, and transports them from place to place when travel is necessary. The Bureau keeps the records of both officers and men.

Bureau of Medicine and Surgery.—The duties of the Bureau of Medicine and Surgery are indicated by its name. It directs the hospitals and the medical work on board ship through the surgeons, dental surgeons, hospital-corps, and female nurse corps of the navy. (The last named do not serve on board ship.) Besides the care of the sick and injured, the Bureau supervises hygiene, both ashore and afloat. It examines physically all recruits before enlistment, and keeps medical records of all in the service for reference in case of disability and for the information of the Pension Office.

Materials Bureaus.—Next come the four material bureaus: Construction, Engineering, Ordnance and Aeronautics. The first designs and builds the ships of the navy. The second is in charge of engineering, including the design and manufacture of steam, electric and motor engines and of radio installations. Both of these Bureaus have experimental research stations to promote their efficiency. The Bureau of Ordnance designs and manufactures weapons and ammunition, such as guns, armor plate, torpedoes, bombs, mines, gunpowder, fuses and the like. The Bureau of Aeronautics is the newest of the Bureaus and is in charge of all types of flying vehicles and their equipment. An Assistant Secretary of the Navy has recently been authorized by Congress, who coördinates the work of naval aeronautics with that of the Departments of War and of Commerce.

The Bureau of Supplies and Accounts handles the finances of the navy, pays the personnel, both civil and military, and makes all contracts. Besides, it feeds and clothes the personnel and maintains the stocks of material for itself and other Bureaus which must be kept on hand ready for routine use or for the emergency of war.

Bureau of Yards and Docks.—All the above-named Bureaus need land and buildings to carry on their activities. The Bureau of Yards and Docks has charge of real estate. It designs, builds and maintains roads, shops, offices, hospitals, dry docks and other buildings on naval property. As all its services are rendered for the facilitation of the work of other branches of the navy, it consults each of them in matters that concern it, and lays out its plans accordingly. All of these Bureaus have funds annually placed at their disposal by Congress which they disburse through the Bureau of Supplies and Accounts.

Judge-Advocate-General.—The legal affairs of the Department are managed in the Office of the Judge-Advocate-General. This office is in two sections. The Solicitor is at the head of the civil division, which deals with matters of law such as arise in the conduct of business of every great corporation. The military branch supervises the legal part of the discipline of the navy. All records of courts-martial go before it for review previous to action by the Secretary or the President if such is necessary. It supervises the naval prisons.

Navy Secretary's Council.—These various branches of the Department are coördinated by the Secretary's Council, at which the Chiefs of Bureaus and other officers periodically meet to discuss and arrange for current work. There is, moreover, the General Board, composed of certain *ex-officio* members and officers who have held high commands. This Board is charged with the ship-building policy of the navy and is called upon by the Secretary for recommendations as to important matters of Departmental policy.

OPERATION AND MAINTENANCE

Naval Stations.—The physical work of maintenance of the navy is carried on at Naval Stations numbering over two hundred, great and small, including technical schools, hospitals, barracks, shipyards, gun and munitions factories, magazines and depots for stores of all kinds, radio stations, research laboratories, purchas-

ing agencies, etc. These establishments are mostly operated by civilian personnel and are directed from the Navy Department by the Navy Yard Division under the Assistant Secretary of the Navy. The principal naval stations are each industrially organized under a Commandant, who carries on the work of construction, repair and supply of ships according to directions from the responsible bureaus in Washington, who allot him the necessary sum for each task.

The Office of Naval Operations accepts ships, men and supplies from the maintenance side of the Department and works them up into efficient ships and fleets and uses them in peace and war to carry out the policies of the nation. The head of the office is the ranking officer of the navy, *ex-officio*. The office is organized in several divisions. The Training Division is in charge of all drills, target practice, steaming exercises and athletics. By a system of competition and observation it maintains efficiency in the fleet. The Office of Intelligence collects at home and abroad information useful to the navy. It is aided by naval attachés at the American legations abroad who report to the Department what is happening there as to naval affairs, and as to the status of the navy of each power.

The Planning Section draws up plans for war under various conditions. Such plans usually go no further than the mobilization of the active and reserve strength, a concentration of force in some suitable locality, arrangements for supply and maintenance of the fleet and a decision as to the objective toward which the combatant effort will be directed. The Division of Material coordinates with the building bureaus to arrange for repairs to ships in active service. The Division of Ship Movements manages the ships and fleets in commission. The Communications Office is in charge of all radio and telegraphic work. There is an Inspection division and a Districts Division handling naval matters in different parts of the country, mostly affairs of naval reserves.

Appropriations for the Navy are controlled by the Bureau of the Budget, which has its representative in the Navy Department. After receiving the President's orders, the Budget Officer allots to each Department the sum it is to have for the year. The Secretary, in council with the Bureau Chiefs, then allots to each of them a sum whose total will exhaust the allotment, and a bill is prepared for submission to Congress.

THE FLEET

Classes of Ships.—A few ships take their orders directly from the Office of Operations, but the great majority are members of squadrons or fleets. The largest command, known as the United States Fleet, is composed of all types of ships, both combatant and auxiliary, including battleships, cruisers, torpedo boats, and submarines, besides ships for supply, repairs and hospitals. These ships, all under one Commander-in-Chief, are grouped in appropriate subdivisions under flag-officers who are responsible for drills, maneuvers, efficiency and discipline of their respective commands. Thus the fleet is maintained in readiness for service, for even in peace some detachment may be called on to act in conjunction with the State Department in support of the foreign policy of the administration.

Ship Organization and Functions.—Each ship is under the command of a captain who exercises authority over all on board, subject himself to the Navy Regulations approved by the President as Commander-in-Chief. The organization for battle is also that for carrying on the daily routine. The ship's company is distributed in "divisions." The Navigator's Division handles the ship as a whole under the orders of the Captain. The helmsmen, leadsmen and lookouts compose it. The Engineer's Division is in charge of the steam, electrical and motor machinery. Several Gun and Torpedo Divisions handle the weapons of the ship. There is a Small-arms Division (usually marines) and an Airplane Division for Airplanes. A Fire Control Division observes the enemy and

directs the gun-fire with the help of observers in the airplanes. A Repair Division of mechanics remedies damages in battle. The Surgical Division cares for the injured. A Signal Division communicates with other ships and the rest of the world by radio, visual and sound signals. The Commissary Division provides and cooks all rations. The Paymaster of the ship is the Commissary and also the General Storekeeper and Finance Officer.

The general work of maintenance and repair is carried on by the different divisions, each of which is responsible for the good order and cleanliness of that part of the ship in the neighborhood of its own battle station. The divisional work of maintenance is supplemented as may be necessary by the mechanics of the ship's company.

MARINE CORPS

Sea and Land Duties.—There is within the navy an important unit, as yet unnamed, the Marine Corps. This is a body of soldiers forming part of the navy. Marines do sea-duty on board the larger ships. They man part of the ship's battery and form the small-arms division and are a part or all of any landing force that may be sent away from the ship. When serving on shipboard they are an integral part of their ship's company, in no way in excess of the battle complement. The marines, not doing sea-duty, are organized as an expeditionary force for quick mobilization to seize an advanced base for the navy in case of war. For this purpose the Expeditionary Force is organized like an army. Other marines on shore are quartered in military posts at the various naval stations, where they do duty as guards.

Headquarter organization of the Marine Corps is under a Major-General Commandant, and is much like that of the army (which see), except that it is not so entirely self-dependent as the army. The marines draw their ammunition, small-arms, artillery, and medical service as well as some other services from the naval bureaus.

AVIATION SERVICE

Need of Coöperation.—It has been suggested to sever the aviation service from the army and navy and make it into an independent branch of the country's armament, and then to combine the three arms of army, navy and aviation in one huge organization of "The National Defense." This project has not commended itself to the responsible authorities of the Government. It is alleged that some of the chief backers of the proposition are certain manufacturers who believe that such a step would increase business for them. However that may be, the air service must always operate in close conjunction with the army or navy as the case may be. Both need it as an important auxiliary to their own work. Moreover, should it be made an independent arm, immediately it would be obliged to organize round itself a military ground force, or a fleet to enable it to operate against the enemy. This happened to the British air force in Mesopotamia, where a considerable army had been made subordinate to the Commanding Air Marshall in order to permit the Air Force to maintain itself near the hostile area.

COORDINATION OF ARMY AND NAVY

Joint Board of Officers.—The administration does not believe that military efficiency will be increased by uniting the army and navy in one military structure, on account of the added complexity of management which is already sufficiently great. Nevertheless, both army and navy have long been aware that modern war demands a greater measure of coordination than was customary in the past, and steps have been taken to provide for it without merging the two Departments. In 1903 the Secretaries of War and of the Navy established a Joint Board of officers of the two services to coördinate the action of the two services where it seemed desirable. The matters cognizant by this Board and its procedure were revised in 1919. It is without executive authority, but when its recommendations are approved by the Secretaries (sometimes the President

must approve), they become effective. The Board has prepared regulations for the joint action of the army and navy and of their air components when coöperating in war. This cooperation is carried further by local Joint Committees representing Army Corps Areas and their corresponding Naval Districts which take cognizance of local subjects and report to their respective Chiefs as to appropriate action.

Joint Aeronautical Board.—There is a Joint Aeronautical Board to investigate and report to the Secretaries of War and of the Navy upon questions jointly affecting the development and employment of aviation in both services. There is also an Army and Navy Munitions Board which coördinates the plans for acquiring munitions and other supplies needed for war purposes, so that the supply agencies of the two services will not conflict. The organization of the army and navy for joint action under the supreme command of the President, as constitutional Commander-in-Chief, is thus provided for without the need of resorting to centralization by action taken by legislation.

THE FUNCTIONS OF THE NAVY

By William Ledyard Rodgers

Rear Admiral, United States Navy

PURPOSES OF A NAVY

Defensive Rôle.—The navy is a defensive arm, but its defensive rôle is much more extensive than the mere protection of the coasts from hostile gunfire, as so many erroneously believe. The function of the navy is to maintain and defend the policies of the United States. The underlying and fundamental policy of this democratic republic is to continue and promote the prosperity of the whole people. Above all, we desire peace as the basis of prosperity. In the present state of civilization, an unarmed nation cannot be safe, but some measure of security may be reached by armaments:—for that we need a navy.

Trade Protection.—The international policies of this country are based on foreign trade and always have been. Our geographical position in the world is such that we can reach the world (Canada and Mexico excepted) only by sea. Ocean trade and its guardian, the navy, are essential to the national prosperity. It is wrong for us of this country to think that we may find some better protector of our trade than the navy. We are prone to think of law as such a safeguard because we are one of the richest nations and we would like to have our wealth protected by the conservatism of law. But we must remember that force is necessary to compel obedience to any law, and there is no international force to back international law. Nations less well-to-do than ourselves are jealous of our favored position in the world, and the word of the law would be a poor guardian of our prosperity. We can rely with confidence only upon our own armament.

"Open Door" Policy.—This country needs its navy to defend the American policy of the "open door" in foreign trade. Within the last century the development of steam transportation by sea and land has made the world more of an economic unit than it ever was before, without in any way dispelling international jealousies and rivalry. The United States, Germany, Great Britain, and France are the four chief manufacturing nations of the world which draw the raw products of industry from every part of the world and export the products of their factories in payment. The prosperity of each requires free access to the markets of the world. The United States exports about 10 per cent of all the products of its fields and factories. Once we relied on England to lend us money to build

our railways, and we let her ships export our raw products. We are no longer England's client, but her economic rival everywhere. To retain the full measure of our prosperity we must reach foreign markets by our own merchant shipping.

NEUTRAL SERVICE

Protection in War Times.—In peace and war the merchant fleet must be protected by a strong navy. America's century-old plan for the freedom of commerce during war has failed to commend itself to the world during all that time, and even we ourselves have not supported our own doctrine when the country has itself been at war. An enemy may be subdued by depriving him of necessaries as well as by bloodshed. Thus war against commerce is a very potent means of applying force, as both England and Germany found in the last war. Merely by asserting neutral right, we cannot hope to induce a belligerent to renounce this form of attack, for although neutral trade is in itself innocent, yet so far as it is an aid to one belligerent it is hostile to the other.

An international law of war will be unable to protect neutral commerce, for the methods of war against property are not governed by true law, but merely by empiric rules of conduct established by the belligerent which treats commerce with the enemy with as much severity as may be without driving important neutrals into hostilities. The belligerents thus have considerable latitude, for no nation will go to war unless strongly pressed, and neutrals will think it better to suffer much rather than resort to the last remedy of war. The United States aims to be neutral in foreign wars and desires to have its peaceful trade respected by the warring powers. A strong navy is the best way to secure this end.

Protection of Neutrality.—A chief function of our navy, therefore, is to warn belligerents that neutral American commerce is not to be unduly subject to belligerent interference. Its warning will be effective when it is as strong as is authorized by the spirit of the Treaty of Washington:—that is, as strong as the British navy or second to none. Even neutral nations suffer, although indirectly, from the hostilities of other nations and it is not to be thought that our navy will completely preserve American prosperity during wars. Yet if the existence of a strong navy enables us somewhat better to preserve the freedom of our commerce on the seas, and our neutrality with it, the navy will serve the country well. Such is the function of the navy in peace.

COMBATANT SERVICE

The second function of our navy is its combatant service when this country is at war. Then the productive power of the country is in great measure diverted to war supplies of every kind, and the needs of the people as well as the requirements of war demand increased supplies from overseas. For this we need both commercial shipping and a navy to protect the former's business in every part of the world. Under the legal doctrine of "continuous voyage" goods whose ultimate destination is for enemy consumption may be seized as lawful prize wherever apprehended. Great Britain acted on this doctrine in the Great War, and Germany went even further; she destroyed enemy goods instead of seizing them. In the future we may expect our enemy to strike at our sea-borne commerce wherever found and we shall do the same to him. The duty, the function of our navy, is therefore to deny our enemy the use of the sea either for military or civil traffic, and to keep the seas open for our own use.

COAST DEFENSE

The third function of our navy is that of coast defense. It is substantially accomplished by a fleet adequate for commerce protection, for such is our geographic position that an enemy cannot gain access to our coasts in any great strength unless he has first overcome the main fleet. But undoubtedly it would be imprudent not to provide local naval defense in addition to harbor fortifica-

tions. For this purpose submarines are particularly suitable, since for serious operations against a hostile coast the attacking ships must stop, and then submarines have their best opportunity.

NAVAL CONSTRUCTION AND EQUIPMENT

By Peter Bain

Editor, *Shipping Illustrated*

NEW CONSTRUCTION

Achievement Slight.—The year 1928 as far as naval construction is concerned was, on the whole, uneventful. On December 3rd, President Coolidge, in his message to the 70th Congress, called for a defensive program of fifteen modern cruisers and one airplane carrier. This furnished about the only morsel of immediate and prospective fleet betterment to which the twelve months may claim for itself any credit for constructive effort or achievement. It is not implied, however, that as a nation we had been smugly content. Our naval status like that of our merchant marine status lost nothing of its national importance during what was apparently a lengthy period of inaction. The desire to have, and the will to possess, a naval defensive equipment of vessel number, variety, power and speed, and resistive fighting caliber of personnel and guns, commensurate with inextravagant ideas of possible need, or creative and maintenance cost, harmonized not at all with the current constructional inactivity already noted. Keen dissatisfaction with our relative position as a world sea power was given, from time to time, generous display in our legislative halls, in the press, on the platform and at social functions having to do with ships—naval and merchant.

Defense and Trade Needs.—Our parity with Great Britain, which the Disarmament Conference Treaty of the Harding Administration conferred upon us, may have existed for a brief period thereafter. It does not now, in the aggregate, nor does the modest construction program requested of Congress by President Coolidge seek more than that the comparative basis be raised somewhat. The fifteen cruisers and one airplane carrier are rather the outcome of an economic necessity, arising from far-flung coast lines, widely separate in spite of the Panama Canal; hinterlands that are assuming daily an enlarged industrial importance; expanding world trade, commerce and travel, and a steadily developing ocean service merchant marine. The purpose of a navy, then, involves more than the mere defense of our coast lines. We need a navy when other nations are at war and we are neutral, as well as a navy when we ourselves are at war. What avails the herculean efforts being put forth to build up a merchant fleet for the transportation of freight and passengers overseas if no naval equipment be concurrently built and maintained to the end that protection be afforded these merchantmen from attack, whether we be belligerent or neutral.

CRUISER DEFICIENCY

Provisions of New Bill.—Generally accepted standards of estimating national naval fitness show that we are deficient in light, fast and powerful cruisers. We have ten comparatively new vessels, mounting six-inch caliber guns, twenty-two that are old, and eight to be built. Renewals and replacements must be provided. The bill authorizing construction of fifteen cruisers and one airplane carrier had passed the House in a previous session and is now pending in the Senate. In the cruiser bill there is a time clause, but this the President wants eliminated. The time clause assures the start of construction in 1929—the laying-down of five cruisers in that and the succeeding two years. Its elimination, therefore, will leave

uncertain when construction will begin and, naturally, when the program will be completed. The bill, in effect, will be little more than an authorization, the money appropriation necessary to the start and carrying-on of construction being left for future consideration. The cruisers sought are to be of 10,000 tons displacement, mounting 8-inch caliber guns. The Washington Disarmament Conference Treaty set no cruiser limit, only battleships and aircraft carriers being restricted.

Pending Construction.—Those now building and the fifteen now seeking authorization are all simply part of a necessary replacement program. Again, and notwithstnading the fact that every cruiser the United States has in service today will be obsolete before those now authorized and those sought to be authorized are completed, our cruiser tonnage would only read 300,000, the limit that our representatives at the Geneva Naval Conference suggested would be parity for Great Britain and ourselves. The former, it will perhaps be remembered, insisted on being allowed 400,000 tons, an insistence that culminated in the Conference failure. Since the Washington Disarmament Conference, we have laid down eight cruisers and three submarines. None of the cruisers has been completed, i. e., put to the proof.

Navy Secretary's Program.—The Secretary of the Navy, early in the past year, submitted to Congress a building program of naval ships in carefully determined numbers in order to bring the fleet into the position and condition of a well balanced whole, and to replace such ships as had already passed or would soon pass the age limit of usefulness. This building program failed of passage in the closing hours of the Congressional Session. The program embraced four different types of naval craft,—cruisers, airplane carriers, destroyer leaders and submarines. In the event of our being involved in a war, construction in numbers of each type would most certainly become necessary. That program called for 25 light cruisers costing $17,000,000 each; 9 destroyer leaders costing $5,000,000 each; and 5 aircraft carriers costing $19,000,000 each.

OVERSEAS COMMERCE

Comparison With Great Britain.—Reverting again to the question of protecting our overseas commerce, either as a neutral or a belligerent, and having regard to Great Britain's insistence that she be allowed a cruiser tonnage of 400,000, a comparison of her trade figures and ours may prove enlightening. Seaborne trade of the United States amounts in round figures to nineteen billion dollars annually while that of Great Britain is about ten billion dollars, or rather more than half of our own. Again, all of our nineteen billion trade relates to open sea transportation, whereas about one-third of Great Britain's is with the continent of Europe via the North Sea and the Channel, leaving thereby only about seven billion dollars of trade to be considered when determining the relative protection necessary as against our nineteen billion.

CONSTRUCTION ACTIVITIES AND NEEDS

Replacement.—During our time of idleness, which dates of course from the Disarmament Conference in Washington, Great Britain has not only built but is still building 10,000 tons displacement cruisers and has built or is building eleven destroyers and destroyer leaders; France 44, Italy 28, and Japan 51. Although at present we have 274 first line destroyers, 66 of them reach the end of their effective life not later than 1934 and another 105 of them just one year later. It is an absolute necessity, then, that we should prepare for the replacement of these vessels by maintaining the construction of new destroyers in order to keep design and engineering skill right up-to-date and, of no less national importance, to insure the retention in this country of the expert ability that goes with successful constructional and service achievement of this type craft.

Submarines.—Since the war, we have continued to build submarines

in small numbers, yet developing new types at intervals, a circumstance that has permitted designs to be kept up-to-date. The main strength of our submarine fleet consists, however, of vessels built during the war; these, therefore, are rapidly approaching the end of their thirteen years of generally recognized effectiveness. By 1933, seventy-five of our total of one hundred and twenty-two will have passed the effective stage. On December 12th, the House passed bills providing $2,700,000 as an additional appropriation to complete submarines V-5 and V-6 which are now under construction. These vessels, when completed, will cost $6,500,000 each. They were authorized under legislation previously passed. The engines for both vessels are being constructed at the New York Navy Yard. Submarine maintenance, repair, alteration and operation as of the fiscal year ended June 30, 1927, amounted to $10,272,469. Figures for June 30, 1928, are not yet available.

Capital Ships.—Capital ship construction has, of course, been a dead issue since the Washington Disarmament Conference, and while something will certainly be done about it sooner or later, this type ship is likely to scale down in importance as a piece of offensive or defensive naval equipment. Such an eventuality is already forecast in an objection lodged against a bill calling for rather extensive repairs and betterments on battleships now in service. In a word, the whole naval policy of the United States is likely to come up for review when the Senate takes up further consideration of the Fifteen Cruiser and One Airplane Carrier Bill. There is a growing sentiment that an up-to-date naval policy for the United States should concentrate on the construction of airplanes, airplane carriers, and submarines rather than on expensive capital ship and kindred surface craft. On December 12, the House passed bills providing $650,000 for the modernization of the battleship *California*, and $450,000 additional to complete the modernization of the battleships *Oklahoma* and *Nevada*.

The Outlook.—The new construction outlook for 1929 is not very promising, notwithstanding the probable authorization of the fifteen 10,000 tons displacement cruisers and the one airplane carrier. Even if the time clause is retained, the prospect may not be improved to any great extent because there is an almost certain naval armaments reduction conference just in the offing and any or all authorizations will undoubtedly carry a qualifying clause or clauses relative to its meeting and decisions. Our shipyards, naval and merchant, are hungry for new construction, repair, overhauling and reconditioning.

CONFERENCES AND PROGRAMS

President Coolidge on Naval Defense.—President Coolidge in his Armistice Day address as well as in his later message to Congress advocated more cruisers for the navy as required by "world standards of defense, eliminating all competition." The present size of our regular army was entirely adequate, he said, but the situation was different with respect to the sea. He declared that, having few fueling stations, the United States needed warships of large tonnage, and, "having scarcely any merchant vessels capable of mounting five and six inch guns, it is obvious that, based on needs, we are entitled to a larger number of warships than a nation having these advantages." To any one conversant with naval and merchant marine affairs, this was a reference to the British Navy which has fuel stations, —coal and oil—strung around the world, and in time of war can fall back upon the arming of the merchant marine with 5-inch and 6-inch caliber guns.

The President considered it significant that foreign governments had agreed to limit classes of combat vessels in which the United States was superior at the time of the Washington Conference on Naval Limitation, but refused limitation in the class in which they were superior. The fact that the Washington Conference failed to limit the number of cruis-

ers, lesser craft and submarines which still can be constructed without limit by any nation, was stressed by the President, who said the United States "made altogether the heaviest sacrifice" in scrapping warships already begun. Since that Conference, he said, the British have begun and completed seven cruisers, are building eight and have five more authorized. When their present legislation is carried out, he continued, they will have sixty-eight cruisers. When ours is carried out, we would have forty. It is obvious that eliminating all competition, world standards of defense require us to have more cruisers.

Washington Conference Results.—The Limitation of Armament Conference of 1921-22 and its treaty provisions—the latter still operates—can hardly be said to have been fruitful of much achievement, except that, in as far as the United States is concerned, an inferior international standing has resulted. We scrapped approximately 850,000 tons of naval craft. This scrapping program cost us close to $400,000,000. Had these vessels been allowed to go forward to completion, the United States would have attained the individual naval supremacy of the world. We scrapped 19 vessels, built and afloat, and cancelled the building program of 13 others, or 32 vessels in all of 842,380 tons. Great Britain scrapped 19 of 397,250 tons, and Japan 16 of 354,709 tons. France and Italy didn't scrap any. In a word, the United States scrapped twice the tonnage of any other Conference participant, and for good measure, as it were, agreed to abandon and did abandon a building program that otherwise meant for an individual nation, world supremacy.

In the seven years interval, nations that were parties to the Conference have shown large gains in naval vessels,—built and building—leaving us as far behind in this respect as in that of merchant shipping. The records show that naval construction activities of the Conference nations for vessels laid down or appropriated for, contracted for, built and building, credit the British Empire with 55 vessels of 335,769 tons; Japan, 127 vessels of 401,361 tons; France, 120 vessels of 291,785 tons; Italy, 71 vessels of 151,374 tons and the United States with 19 vessels of 157,790 tons. In view of the foregoing, a well balanced construction program seems both fitting and fair.

NAVAL AERONAUTICS

By W. A. Moffett

Rear Admiral, U.S.N., Chief of the Bureau of Aeronautics, Navy Department

AVIATION DEVELOPMENTS

Value to Navy.—Aviation has proved its value to such an extent that it is accepted as one of the important elements of the Naval establishment. The progress achieved both in the material and operating departments during the past year has contributed much toward emphasizing this fact.

Design Tests.—The two wind tunnels at the Navy Yard, Washington, have been in operation continuously during this period, and data indispensable to the Design Section of the Bureau of Aeronautics have been obtained from the multifarious tests conducted, of which thirty-three were airplane models, twenty-eight airfoils, four fuselages, six seaplane floats, three radiator and one very elaborate airship test. Similar work was carried on at the Model Basin (also located at the Navy Yard, Washington, D. C.) where thirty tests were conducted on aeronautical material.

Metal propellers have been in service for several years but the process of making them standard has been necessarily slow due to the number of old types on hand. The use of metal

propellers in the future has been assured by a new stress analysis developed in the Navy. This analysis has practically eliminated failures. Additional data have been obtained from operations with detachable blade propellers and, as a result of the adjustable pitch feature, similar blade designs are used on several different types of planes.

Flotation gear has been installed in all land planes which normally operate over water (carrier aircraft); amphibian gear has been perfected and is now being installed on service planes where this landing gear is required; Frieze ailerons, which permit of greater ease in lateral control, have been adapted for use on Navy types and a number installed; brakes have been improved, and more efficient oleo landing gear has been incorporated in new aircraft.

TYPES OF AIRPLANES

Training Planes.—In view of the extensive training program made necessary to fulfill the terms of our Five Year Building Program, particular attention has been directed toward the procurement of new training planes. One entirely new type has been developed, i.e., designed, built, tested mechanically and also on training of students, and is now in production. Two types of experimental fighting planes constructed last year have been approved and are now in production. Both of these fighters are materially superior in performance to types now in service. A new experimental bomber was brought out last year. Tests have demonstrated that this plane has much better performance than previous types, consequently it has been put into production and a number have already been delivered to squadrons.

Patrol Seaplanes.—One of the extremely important activities with which Naval Aviation is charged is patrolling our coasts and those areas at sea within cruising radius of our coasts. Patrol types have been in existence for several years, but the two types developed during the past year have surpassed in performance any patrol seaplanes previously constructed in this country. As a result, the first production order has been placed and deliveries are expected in the near future. The experience gained from the construction and operation of large planes of this kind has stimulated interest commercially, and manufacturers are now receiving orders from commercial companies for similar aircraft.

Air-cooled engines have been definitely adopted as the standard installation in all service types of planes. As a result, maintenance costs are lower, the planes are much more reliable and the performance of each has been decidedly improved. The latter is particularly apparent in patrol seaplanes which now take off more quickly, carry a heavier load and have a greater cruising radius than with water-cooled engines. The development of several new radial engines ranging from 160 to 350 h.p. has been fostered by the Bureau of Aeronautics, additional power has been built into one of the engines now in use, and, as a whole, the power plant situation as regards the needs of Naval Aviation may be said to be very satisfactory.

Flying Instruments.—Much effort has been devoted to the problem of night flying and bad weather operation of aircraft. In this connection, instruments are extremely important. Of these, a more efficient grouping has been effected which gives engine or flying data as a whole and eliminates the necessity of obtaining the desired information from individual instruments placed in various locations in different types. In addition, all flying instruments have been reduced in size and weight and each is to have a dial 2¾ inches in diameter. A corresponding reduction has been made in the size and weight of the engine instruments.

Rigid Airship Design.—Bids were reopened for the design competition for two new rigid airships. The winner will be decided upon when the bids are examined on August 9, 1928. Congress has approved the purchase of these two ships and it is hoped that a contract can be let shortly after the bids are examined.

THE "LOS ANGELES"

Lessons from Operation.—Operations of the *Los Angeles* have continued throughout the year, with accompanying steady progress in training personnel and solution of various problems connected with airship operation. The new set of gas cells appropriated for in 1928 were ordered and approximately half the number have been delivered and installed in the airship. These cells serve greatly to reduce helium losses and improve the airship's general condition. Two spare engines were procured and several of those received with the ship have been modernized. All things considered, the *Los Angeles* is in very good condition.

Flights.—Most of the 649 hours of flying done by the *Los Angeles* has been of routine character, but the flight to Panama and a flight in search of the missing airplane, *Dawn*, are noteworthy. Increased attention has been devoted to the solution of airship-handling problems, and gratifying progress is reported.

Mooring Masts.—The stub type of mooring mast is promising under certain situations. A crude mast of this type was used successfuly for mooring the *Los Angeles* at Panama. A mobile mast of similar type is under construction and due for delivery about September 1, 1928. When this is available, it is expected to be able to make much more rapid progress in the use of stub masts for handling airships in and out of sheds, as well as for mooring. A circular track has been constructed around the selected location for the stub mast. A car running on this track will support the aft engine car on the airship.

THE AIR FLEET

Flight Apparatus.—Apparatus is under construction and due for early completion that will permit experiments to be carried out with carrying, launching, and recovering airplanes from airships.

"Saratoga" and "Lexington."—The past year saw the addition of the *Saratoga* and *Lexington* to the Fleet, two vessels of exceptional interest to aviation. The *Saratoga* was commissioned on November 16, 1927, and the *Lexington* on December 14, 1927. Both vessels, as soon as they were outfitted, left for the west coast to join the Fleet. Landings on board were commenced immediately after commissioning. Aviation activities, although greatly interfered with by acceptance trials and gunnery schedules, have progressed at every opportunity. The arresting arrangements and the catapults for these vessels function as intended with no difficulties. The only alteration of any importance that was made on either of these vessels after commissioning was the alteration of wire spacing by the ship's force of the *Lexington* to bring her arresting gear in conformity with those of the *Saratoga* and *Langley*.

The "Langley."—The employment of the *Langley* for both training and operations has increased during the past year. Intensive operations have shown the entire practicability of increasing not only her complement of airplanes but those of other carriers to a hitherto unforeseen limit. Forty-two airplanes were successfully operated from the deck of the *Langley* during the recent Hawaiian cruise.

CARRIER PROBLEMS

Experimental Work.—In nature and in volume experimental work on carrier problems has assumed the utmost importance. Miscellaneous mechanical appliances to assist in the operation of airplanes from the decks of carriers have been developed and standardized. A considerable amount of experience with wheel brakes has been obtained. The major problem of reducing the number of material casualties has been carefully studied and progress has been made toward an eventual solution along several different lines. Preliminary work on new methods of arresting airplanes has been undertaken with considerable promise. Design information regarding arresting gear has been amplified and radical modifications of appliances on airplanes to decrease weight and resistance and increase safety have been initiated.

Shortage of Aviators.—A serious shortage exists in the number of

trained aviators in the Navy; however, this situation should be at least partially remedied in the near future as several plans have been proposed whereby young men may be obtained for such duty. In all other respects the stipulations of the Five Year Bill are being carried out. Planes are being procured as needed, our aviators are receiving the best training possible, and although there were no spectacular achievements during the year, progress was steady and extremely commendable in every phase of activity connected with Naval Aviation.

NAVAL EDUCATION

By Carroll Storrs Alden

Head of Department of English, U. S. Naval Academy

THE U. S. NAVAL ACADEMY

Special Preparation.—Never was duty in the Navy so varied and highly specialized as to-day. That officers and men may not be unequal to the new responsibilities, special preparation, professional in character with a study of the fundamentals of the sciences and arts concerned, is widely offered. It is hoped that greater efficiency on the part of officers and men will to a degree compensate for the relatively small number. A single instance will show the perplexing situation. There were approximately 5000 more men assigned to aeronautical duty in 1928 than in 1923; yet there were 2000 less allowed for the entire Navy. Thus for the surface Navy 7000 less were available.

Appointments and Registration.—For the Naval Academy, Congress voted in the spring of 1928 to increase the number of appointments of midshipmen made by each senator and congressman from three to four. The total registration in September, 1928, was 1791. When the effect of the increase is fully realized it should provide an average of 2200 midshipmen with an entering class of 700.

The Curriculum.—The question of extending the Naval Academy curriculum has been considered, but the decision has been rather to hold to the teaching of the essential principles underlying Seamanship, Navigation, Electrical Engineering, Aviation, etc., relying upon the fleet, the special schools, the Naval Academy Post-graduate School, and the Naval War College for advanced instruction.

Athletic Policy.—In the Naval Academy and also in the fleet it is the policy to encourage mass and intramural athletics rather than to concentrate on a few big events. The purpose is that every officer and man shall engage in some form of athletics "in order that the individual members of the personnel may maintain a properly coördinated mental and physical condition of action and endurance."

SPECIAL NAVAL SCHOOLS

Post-graduate School.—In the Naval Academy Post-graduate School the General Line Course promises to become the largest and perhaps the most important of the several courses given. Fifteen officers were detailed to take this the first year (1927-28). They are spending the second year at the Naval War College where they are taking the Junior Officers' Course. The succeeding class in the General Line Course consists of thirty officers, and this number in 1929 will probably be doubled. The object is to fit younger officers better to perform the duties of heads of departments of large vessels as well as the duties of commanding officers of small craft. The curriculum includes cultural as well as professional subjects.

Aviation and Submarines.—Of the special schools, that at Pensacola, Florida, continues to give its attention to aviation as applied to craft heavier than air; that at Lakehurst, New Jersey, to craft lighter than air. The submarine base, New London,

Conn., and the Torepdo Station, Newport, R. I., prepares officers for duty as indicated by the name.

Chemical Warfare belongs rather to the army, but a few naval officers, by means of an arrangement with the War Department, are regularly sent to the Edgewood Arsenal, Edgewood, Maryland, for a brief period of instruction. During the past year fifty-seven officers of the Navy have completed this course.

Study of Optics.—For the study of Optics the Navy Department has organized two courses at the Naval Gun Factory. The short course of four weeks' duration is designed to prepare those taking it for duty as optical and range-finder officers of single units. The long course of six months fits officers to take charge of the optical repair shops and to act as inspectors of optical material. During the past year thirty-one officers completed the short course.

The Naval War College at Newport, R. I., with somewhat over one hundred officers in attendance, gives a senior course for flag officers, captains, and commanders, to supplement their sea experience and to prepare them for higher command, and a junior course for officers below the rank of commander, to fit them for duty on the staff of flag officers and to give them a knowledge of strategy and tactics.

For the enlisted men educational courses of the widest range in professional, technical, and academic subjects are offered, and during the year about 4850 men have completed such courses. These are of great service in fostering professional pride and furnishing opportunity for advancement in rating.

Libraries.—Libraries supplied to all vessels and important shore stations contain professional and technical works together with modern fiction. These are for both officers and enlisted men. A loan collection lately established by the Bureau of Navigation, with branches at San Diego, Pearl Harbor, and Cavite, contains latest books selected for cultural reading. The great demand by officers for these books is evidence of the wisdom of the project.

OFFICERS' TRAINING CORPS

The Naval Reserve Officers' Training Corps, organized at six colleges and providing for four years of study counting, together with regular undergraduate courses, towards a degree, is steadily progressing. Two hundred and seven of those enrolled have now completed the basic course (covering the first two years). During the summer of 1928 fifteen-day cruises were made. In the Pacific, students from the California and Washington units on board the battleship *Pennsylvania* visited Victoria, British Columbia, and in the Atlantic, one hundred and ninety students from the Georgia School of Technology, Northwestern, Yale, and Harvard units cruised on board the battleship *Wyoming* to Halifax, Nova Scotia. The course as outlined is "to impart a sufficient knowledge of naval subjects to fit the students to perform duties as junior officers of the Naval Reserve to discipline the mind and body, and to inculcate qualities of self-reliance and leadership, which are not only required in a young officer, but are essential in promoting the highest type of American citizenship."

COGNATE SOCIETIES

SERVICE SOCIETIES

American Legion.—777 No. Meridian St., Indianapolis, Ind.

American Remount Association.—Washington, D. C.

American Signal Corps Association.—195 Broadway, New York, N. Y.

Army and Navy Union, U. S. A.—315 Hazen Bldg., Cincinnati, Ohio.

Association of Military Surgeons of the United States.—Army Medical Museum, Washington, D. C.

Chemical Welfare Service.—Edgewood Arsenal, Maryland.

MILITARY TRAINING CAMP ASSOCIATION.—19 W. 44th St., New York, N. Y.

NATIONAL GUARD ASSOCIATION OF THE UNITED STATES.—32nd St. and Lancaster Ave., Philadelphia, Pa.

NAVY LEAGUE OF THE UNITED STATES.—1749 E. St., N. W., Washington, D. C.

QUARTERMASTERS' ASSOCIATION OF THE UNITED STATES.—923 15th St., N. W., Washington, D. C.

RESERVE OFFICERS' ASSOCIATION OF THE UNITED STATES.—1653 Pennsylvania Ave., N. W., Washington, D. C.

SOCIETY OF AMERICAN MILITARY ENGINEERS.—810 Mills Bldg., Washington, D. C.

SOCIETY OF NAVAL ARCHITECTS & MARINE ENGINEERS.—29 W. 39th St., New York, N. Y.

U. S. ARMY ORDNANCE ASSOCIATION.—806 Mills Building, Washington, D. C.

U. S. CAVALRY ASSOCIATION.—1624 H. St., N. W., Washington, D. C.

U. S. FIELD ARTILLERY ASSOCIATION.—1624 H. St., N. W., Washington, D. C.

U. S. INFANTRY ASSOCIATION.—1115 17th St., N. W., Washington, D. C.

UNITED STATES NAVAL INSTITUTE, Annapolis, Md.

PATRIOTIC AND HEREDITARY

COLONIAL DAMES OF AMERICA, 421 E. 61st St., New York, N. Y.

DAUGHTERS OF 1812 U. S. NATIONAL SOCIETY.—108 Iona Ave., Narberth, Pa.

DAUGHTERS OF THE AMERICAN REVOLUTION. — Memorial Continental Hall, Washington, D. C.

DAUGHTERS OF THE REVOLUTION NATIONAL SOCIETY.—420 Lexington Ave., New York, N. Y.

GRAND ARMY OF THE REPUBLIC, Room 5, City Hall, N. Y. C.

MILITARY ORDER OF FOREIGN WARS OF THE U. S.—149 Broadway, New York, N. Y.

MILITARY ORDER OF THE LOYAL LEGION, 140 Nassau St., New York City.

MILITARY ORDER OF THE WORLD WAR.—52 Vanderbilt Ave., New York, N. Y.

NATIONAL SECURITY LEAGUE.—25 W. 43rd St., New York, N. Y.

NATIONAL SOCIETY OF THE SONS OF THE AMERICAN REVOLUTION.—1227 16th St., N. W., Washington, D. C.

NATIONAL SOCIETY OF SONS OF THE REVOLUTION. — Princeton University, Princeton, N. J.

ORDER OF FOUNDERS AND PATRIOTS OF AMERICA.—111 Broadway, New York, N. Y.

PILGRIM SOCIETY.—Pilgrim Hall, Court St., Plymouth, Mass.

SOCIETY OF COLONIAL WARS.—155 E. 42nd St.

SOCIETY OF THE CINCINNATI.—136 W. Lanvale St., Baltimore, Md.

SOCIETY OF MAYFLOWER DESCENDANTS.—44 E. 23rd St., New York, N. Y.

SONS OF CONFEDERATE VETERANS.—Law Bldg., Richmond, Va.

SONS OF THE AMERICAN REVOLUTION NATIONAL SOCIETY.—1227 16th St., N. W., Washington, D. C.

SONS OF VETERANS.—Reading, Pa.

SPANISH-AMERICAN WAR.—Navy and Military Order.—184 State House, Boston, Mass.

UNITED CONFEDERATE VETERANS, New Orleans, La.

PART FOUR
ECONOMICS AND BUSINESS

DIVISION X
BUSINESS AND FINANCE

ECONOMIC AND BUSINESS CONDITIONS

By S. S. Huebner

Wharton School of Finance and Commerce, University of Pennsylvania

INDICATIONS OF A PROSPEROUS YEAR

With comparatively few exceptions, business conditions during 1928 were better than in 1927; even where declines occurred they were, as a rule, moderate in extent. A review of the various barometers of business will verify this generalization. Check transactions during the first eight months of 1928 exceeded those of the same months in 1927 by over 18 per cent, whereas those of 1927 exceeded the 1926 total by nearly 10 per cent. The volume of stock market transactions during 1928 has been most extraordinary, shares traded in on the New York Exchange (to December 8th) exceeding the full 1927 total by nearly 50 per cent, and the full 1926 total by nearly 80 per cent. Railroad shares were maintained at the highest price level since 1921, while industrial shares, during the first nine months of the year, showed an appreciation of 26 per cent over 1927, and nearly 40 per cent over 1926. Copper shares, likewise, during the first nine months of the year, experienced an increase in quoted market prices of 47 per cent over the 1927 corresponding average, and 64 per cent over 1926. Brokers' loans were also unusually large throughout the year, breaking into new ground almost monthly, and interest rates showed a material rise over the 1927 level.

GROUPING BY INDUSTRIES

Indices by Groups.—Most of the indices of trade will be referred to under the headings of "Résumé of Leading Indices of Trade" and "Index Numbers." But passing reference should also be made to business conditions prevailing in the leading groups of industries not chronicled in the commonly used indices of trade. According to the Babson Reports (for November 5th), "retailed trade for the country as a whole is about 6 per cent greater than a year ago," and "mail order sales are 24 per cent greater than they were at this time a year ago, and the Five-and-Ten-Cent Stores increased 12 per cent." In the metal businesses unusually good conditions also prevailed. Latest accounts indicate that, owing to the demand of the building industry, the railroads, machinery manufacturing industries, and the automobile and agricultural implement manufacturing industries, the consumption of steel in the United States is at the highest rate on record. The price of copper has also reached the highest level in 5 years (15.25¢ for electrolytic copper as compared with 12.50¢ in June of 1927), due to a record-breaking world demand.

In the real estate field, it is true, a retrocession is generally referred to, owing to the fact that the new building supply has outstripped the demand. Activity in this field (for September—Babson Reports of November 5th) is reported to be about 8 per cent below the same month of 1927, whereas rents indicate a decline for the same period of about 7 per cent. Bituminous coal production, during the first nine months of 1928, indicates a reduction of about 10 per cent as compared with the same period in 1927, while cotton consumption shows a reduction of about 14 per cent.

The Better Known Indices.—But these instances are exceptions from the general rule. The National City Bank in its November report on Economic Conditions presents the "following list of the more commonly known measures of business volume which appear to be headed for new high records in 1928: checks cashed at banks, industrial use of electrical power, building construction, steel production, automobile production, agricultural implement output, copper production, tin deliveries to mills, cement production, flour milling, gasoline production, industrial use of rubber, silk, and chemicals, rayon production, cigarette production, retail trade, electrical appliances output, aeroplane production, and motor boat output." The conclusion of the report is that "with business in record volume and profits on the increase, sentiment is naturally optimistic. At their National Convention held the past month, the National Association of Manufacturers reported that of some 4,000 replies to a questionnaire addressed to its members on October 1, 93 per cent pronounced present trade conditions favorable, of whom 17 per cent viewed them as excellent; 41.4 per cent, as good; and 34.5 per cent, as fair; with only 6.8 per cent calling them poor."

RÉSUMÉ OF LEADING INDICES OF TRADE

Business Improvement.—A brief résumé of the leading indices of trade for the major part of 1928, aside from the financial and security market indices already referred to (other sections of the AMERICAN YEAR BOOK), will also serve to show that with few exceptions 1928 business conditions are above normal and somewhat in excess of the 1927 level.

New capital financing for the first eight months of the year is only 1.3 per cent under that of the corresponding period in 1927, but 8.5 per cent and 28 per cent in excess of 1926 and 1925. Industrial dividends paid during the first ten months of the year exceed those of 1927 for the same period by 2.6 per cent and those of 1926 and 1925 by 27 per cent and 56 per cent. New buildings started in 27 northeastern states (representing ¾ of the total population in the United States) as reported by the F. W. Dodge Corporation for the first eight months of 1928 show an increase of 7.2 per cent as compared with the same period of 1927, and of 13 per cent and 20.6 per cent as compared with 1926 and 1925.

Merchandise Exports and Imports.—In the first eight months of 1928, exports were the highest on record for that period since 1921, exceeding those of 1927 and 1926, for the same period, by 1.7 per cent and 5.9 per cent respectively. In the case of imports of merchandise, however, there was a slight falling off for the first eight months of the year, as compared with 1927 and 1926, the decrease being 2.1 per cent and 7.6 per cent respectively. Pig iron production for 1928 (eight months) totaled 24,731,000 tons as compared with 25,329,000 tons for 1927, or a decrease of 2.3 per cent, while the average price per ton for the present year stands at $19.44 as compared with $21.65 for 1927 and $25.18 for 1926. Average weekly revenue freight car loadings for the first nine months of the year stood at 959,798 as compared with the 1927 average for the same period of 994,472, which, in turn, compares with 998,466 in 1926. Gross and net railway earnings also register approximately the same for the first half of the year as they did for the first half of last year, i.e., gross earnings were $14,226 per mile in 1928 as

against $14,768 in 1927, and net earnings $3,493 as against $3,514 for the preceding year.

Production.—Using Babson's latest figures of production in ten leading industries for a comparison between 1928 and 1927, the showing is as follows: automobiles, motor cars and trucks (first nine months' comparison) 21 per cent increase; gasoline (first seven months) 10 per cent increase; pneumatic tires (first six months) 8 per cent increase; copper (first eight months) 2.4 per cent increase; steel ingots (first eight months) 5 per cent increase; lumber (first seven months) 14 per cent increase; cement (first eight months) 2 per cent increase; boots and shoes (first eight months) 1.5 per cent increase; bituminous coal (first nine months) 10 per cent decrease; cotton consumption (first eight months) 14 per cent decrease. The agricultural year has also been satisfactory, although not of record-breaking proportions. As summarized by the National City Bank in its November report: "taking the October estimate of the Department of Agriculture as giving a fairly accurate idea of final yields, total production of all crops shows an increase of 5 per cent over that of last year."

Business Failures.—Reference should also be made to the 1928 record of business failures. As compared with 1927, the first eight months of 1928 show a slightly larger number; namely, 15,245 as contrasted with 14,831. But the liabilities involved total only 343 million dollars as compared with 418 million dollars for the same period in 1927, or a decline of nearly 22 per cent.

Index Numbers. — Last year's AMERICAN YEAR BOOK called attention to a declining tendency in commodity prices. This year's tendency (for the first nine months) has been the reverse, if we may judge by Bradstreet's index of wholesale prices of 96 commodities including foodstuffs, although not to any extraordinary extent. The first nine months' average for 1928, using this index number, was 13.3443 as compared with 12.5724, or an increase of slightly over 6 per cent. The present nine months' average is almost the same as the corresponding averages for 1926 and 1925; namely, 13.1046 and 13.8289. (See first table on p. 310.)

In the outstanding wholesale commodities, however, the price level continued to remain at the figure recorded for 1927. Thus, on the basis of Babson's index number of wholesale prices, covering the basic commodities of hides and leather, print cloth, petroleum, iron and steel, rubber, paper, wool, building materials, non-ferrous metals and bituminous coal, the average price level of 1928 (first eight months) stood at 155, as compared with the corresponding levels of 1927, 1926 and 1925 of 154, 174, and 178. The 1928 figure registers a decline for these basic commodities of nearly 11 per cent as compared with 1926.

LABOR

Price and Volume.—As regards the price and volume of labor, there is an apparent decline as compared with 1927. Employment, during the first eight months of 1928, judging from the number employed in manufacturing industries according to the New York State Department of Labor, was 5.2 per cent under the corresponding average for 1927, while that year, in turn, showed a decrease of 2.6 per cent as compared with 1926. Wages in the manufacturing industries also suffered a slight decrease during 1928, the average for the first eight months of the year being 5.4 per cent below the corresponding average of 1927. But this decline, as well as the one pertaining to the number of workers, must be viewed in the light of the whole record since the close of the World War. Recognition must be given to the great tendency in industry toward consolidation and the introduction of labor-saving machinery.

Indices.—The 1928 Bradstreet's index of commodity prices of 13.3443 must be compared with 18.6642 for 1919, thus showing a decline of nearly 30 per cent. Despite this large decline, however, the wage level of 1928 (211 according to the New York figures) stands at practically the same level

as that prevailing during 1919, i.e., 213. This phenomenon of steady wages (remaining practically at the figure prevailing at the close of the war) as contrasted with so substantial a reduction in commodity prices has been the source of much astonishment. The answer is that industry, through increased production and economies of operation effected by virtue of consolidation and labor-saving machinery, has been enabled to maintain the wage level thus far, despite the decline in commodity prices, at

INDEX NUMBERS

	Bradstreet		Babson		London Economist	
	1928	1927	1928	1927	1928	1927
January	$13.5732	$12.8195	156	167	3945	3975
February	13.5263	12.5153	155	164	3887	3928
March	13.3409	12.5543	154	154	3921	4012
April	13.4161	12.5309	153	148	3967	3944
May	13.4376	12.4405	155	148	4039	3921
June	13.1913	12.4265	155	150	4034	3986
July	13.1418	12.3803	155	150	3951	4004
August	13.1903	12.5830	155	153	3892	4002
September	13.2813	12.9015		157	3847	4071
October	13.1285	13.2647		156		4038
November		13.3937		155		3996
December		13.5348		154		3957

YEARLY AVERAGE

	Bradstreet	London Economist		Bradstreet	London Economist
1902	7.88	2003	1916	11.8236	4216
1903	7.94	2197	1917	15.6385	5418
1904	7.92	2136	1918	18.7117	6036
1905	8.09	2342	1919	18.6642	6227
1906	8.41	2361	1920	18.8096	7746
1907	8.90	2508	1921	11.3695	5004
1908	8.00	2223	1922	12.1186	4303
1909	8.51	2231	1923	13.4028	4339
1910	8.98	2407	1924	12.8672	4661
1911	8.7129	2542	1925	13.9445	4534
1912	9.1867	2699	1926	13.0207	4137
1913	9.2115	2704	1927	12.7788	3986
1914	8.9985	2643	1928	13.3443 *	3943 *
1915	9.8531	3238			

* Average for 8 and 9 months.

CORPORATE FINANCING

(Source of data—Babson's Reports)

	1928		1927	
	Capital	Refunding	Capital	Refunding
January	$408,544,852	$165,028,100	$507,503,100	$102,531,800
February	411,352,150	201,343,948	540,587,655	245,061,060
March	380,707,402	361,242,750	392,426,255	101,947,000
April	484,089,878	349,116,372	388,871,130	131,581,150
May	583,357,035	174,477,240	447,134,520	265,789,450
June	645,882,775	182,550,800	538,295,367	169,252,700
July	284,803,167	38,945,202	341,658,181	29,436,500
August	180,716,260	18,709,418	277,831,769	166,446,000
September	.....	.....	372,585,392	78,778,550
October	.....	.....	574,379,763	159,700,850
November	.....	.....	403,364,642	214,189,800
December	.....	.....	588,591,292	263,472,400

the same time also maintaining an undiminished earning power of profits.

Unemployment.—The only regrettable feature has been a substantial reduction in the number of laborers, owing to the unprecedented employment of labor-saving machinery. While it may not be fair to make comparison in this respect with conditions as they existed immediately upon the close of the war, yet this year's unemployment, according to the New York figures, is considerably below that of 1924 and 1923. The present situation of unemployment, despite apparent prosperous business conditions, is largely due to displacement of labor by the two factors already mentioned. The situation, however, is believed generally to mark merely an era of readjustment, and to be temporary in nature. Newly created industries, it is believed, will gradually absorb the number now unemployed.

YEARLY TOTALS

	Capital	Refunding
1928 *	$3,379,453,519	$1,491,413,830
1927	5,373,229,066	1,928,187,260
1926	4,357,002,720	942,550,970
1925	4,100,725,167	637,384,524
1924	3,322,295,764	516,275,300
1923	2,712,996,155	530,343,942

* For eight months.

THE SECURITY AND MONEY MARKETS

By S. S. Huebner

Wharton School of Finance and Commerce, University of Pennsylvania

GENERAL CONDITIONS

Stock exchange transactions during 1928 set a record for all time. The total greatly exceeded the previous high-record total of 1927. As was explained (last year's American Year Book), 1926 and 1925 also represented high records up to that time. Despite three serious declines during the year, the security market in each instance experienced a full recovery on the average and, at the time of this writing (beginning of December), huge daily transactions are being registered at the highest level of prices established during the present cycle, i.e., since the great liquidation of 1920. Dividend increases and stock distributions have been numerous and large, and market sentiment has been unusually optimistic.

VOLUME OF STOCK TRANSACTIONS

Stock market transactions during 1928 have been most extraordinary. Shares traded in on the New York Stock Exchange totaled 859,441,300 up to December 8th, as compared with 576 millions for all of the year 1927 (the previous record), 451 millions for 1926, 461 millions for 1925 (the record up to that time), and 317 millions during 1919 (the highest record of the preceding industrial cycle). The 1928 total, up to December 8th, exceeded the full 1927 total by nearly 50 per cent, and the 1919 total by nearly 171 per cent. This year's transactions are particularly notable, since the 1927 total exceeded that of 1926 by nearly 27 per cent. Without exception, every month of the year has exceeded the corresponding month of 1927, and only twice,—namely, in February and in July—did monthly transactions fall below 55 million shares. Time upon time, new daily records were established and on several occasions the daily total on the New York Exchange stood between six and seven million shares. It should also be noted that through-

out the year stock transactions on the New York Curb Exchange and on other American Exchange markets also reached unprecedented totals.

STOCK PRICES

Railroad Shares.—As was explained last year, the increase in stock prices was almost as phenomenal as the increase in the volume of transactions. The same may again be said for 1928 as regards industrial and mining shares, although with reference to rail shares price changes were nominal. Babson's composite price list for different groups of selected stocks may be used for illustrative purposes. Thus, using his list of twenty representative railroad stocks, the October, 1928 average high price stood at 142.02, as compared with 144.82 for the corresponding month of 1927. But for all of the first nine months of 1928, the average stood at 142.65 as compared with 135.30 for the corresponding nine months' average in 1927, 114.58 in 1926, 100.69 in 1925, and 74.34 in 1921. Railroad shares may thus be said to be selling at the highest level reached since the great liquidation of 1920. As compared with the average price for 1921, railroad stocks show an appreciation of approximately 92 per cent.

Industrial Shares.—In the field of industrial stocks, the increase in prices has been phenomenal, and this is significant because of the enormous increase in the volume of share transactions that has occurred in this particular group. Again taking Babson's composite prices for twenty leading and representative industrial stocks for illustrative purposes, it appears that the October average high price for 1928 stood at 240.44, as compared with 199.78 for the corresponding month of 1927. For the first nine months of 1928, the average high price is 219.41 as compared with only 173.87 for the corresponding nine months' average in 1927, 156.67 in 1926, 131.39 in 1925, and 75.09 in 1921. Whereas in 1927, as was explained last year, the average percentage of increase in railroad stocks was greater than that occurring in industrial shares, the reverse has occurred during the present year. While the October average for rails in 1928 remained approximately the same as the October average in 1927, the October average for industrials shows an increase of 20 per cent over the October, 1927 average. The first nine months' average of 1928 shows an increase of 26 per cent over the corresponding average for 1927, nearly 40 per cent over 1926, and 179 per cent over 1921, the year following the drastic liquidation of the preceding industrial cycle.

Copper Group.—A similar situation, although not quite so violent, presents itself in the copper group. Although a considerable increase in prices in this group occurred during 1927, a much greater advance took place during the present year. According to Babson's composite prices for twenty leading and representative copper stocks, the average high price for Ocotber, 1928 stood at 56.4, as compared with 37.8 for the corresponding average in 1927, or an increase of 49 per cent. For the first nine months of 1928, the average high price is 48.3 as compared with only 32.7 for the corresponding nine months' average in 1927, 29.4 in 1926, 27.9 in 1925, and 25.5 in 1921. The first nine months' average in 1928 shows an increase of 47 per cent over the similar average for 1927, 64 per cent over 1926, and nearly 90 per cent over 1921, the year, as previously explained, following the violent liquidation of the preceding industrial cycle.

THE BOND MARKET

Sales.—Bond sales on the New York Stock Exchange during 1928 (to December 8th) totaled $2,789,624,000, as compared with $3,139,416,000 for the full year of 1927. In other words, the volume of sales during the present year is approximately the same as it was last year. Owing to much higher money rates, the bond market has remained comparatively dull; its rise and resulting activity having occurred largely in the years 1921-25. Former explanations (the YEAR BOOK 1927) have pointed out that 1927 also

showed only an inappreciable increase in activity over 1926, while that year's bond transactions on the New York Exchange were nearly 11 per cent under those of the year 1925.

Prices.—The 1928 price level for bonds, judging from Babson's composite price list of twenty leading and representative bonds, is actually somewhat under that of the year before. The October, 1928 average stood at 94.8 as compared with the corresponding average of 97.8 for 1927, or a decline of approximately 3 per cent. For the first nine months of 1928, the average stands at 97.8 as compared with the corresponding average for 1927 of 95.6, 92.6 for 1926, 89.3 for 1925, 86.9 for 1924, 84.4 for 1923, 87.0 for 1922, 75.5 for 1921, and 72.7 for 1920. As compared with the 1920 level, the present average of 94.8 shows an appreciation of 30 per cent. But most of this increase occurred during the years 1921-22, following the great decline in interest rates from the high level prevailing in 1919 and 1920. As is so often the case, the bond market experienced its main rise in prices before the main movement in stock prices occurred. Now that interest is centered mainly in stocks and interest rates are reaching higher levels, bonds with their fixed and more moderate return, as compared with stocks, are proving less attractive to the general run of security purchasers. Despite the increase in interest rates, bond prices have shown a remarkable resistance, and the price level has practically shown no tendency towards depreciation.

SECURITY MARKET PRICES

(Figures furnished by Babson's Reports)

	20 R.R. Stocks		20 Ind. Stocks		20 Rep. Copper Stocks			20 Rep. Bonds	
	1928 High	1927 High	1928 High	1927 High		1928 Average	1927 Average	1928 Average	1927 Average
Jan.	141.02	122.56	203.35	156.56	Jan.	46.7	31.9	98.8	94.8
Feb.	136.44	129.16	199.35	161.96	Feb.	43.8	31.7	98.6	94.8
Mar.	141.96	130.30	214.45	161.78	Mar.	44.5	32.0	98.5	95.4
Apr.	145.16	133.83	216.95	167.36	Apr.	46.2	32.4	98.0	96.4
May	147.65	137.35	220.88	172.96	May	49.6	32.4	97.4	96.6
June	144.33	138.18	220.96	171.98	June	48.6	31.2	95.9	95.7
July	139.83	141.26	216.62	182.61	July	48.3	32.0	94.7	95.8
Aug.	143.15	142.97	240.41	190.63	Aug.	50.7	34.1	93.8	96.5
Sept.	144.34	142.05	241.72	198.97	Sept.	56.3	36.2	95.0	97.2
Oct.	142.02 *	144.82	240.44 *	199.78	Oct.	56.4	37.8	94.8	97.8
Nov.		140.85		198.21	Nov.		39.1		98.6
Dec.		143.44		202.40	Dec.		45.6		99.0

SHARES TRADED ON THE NEW YORK STOCK EXCHANGE

(Babson's Reports)

	1928	1927
January	56,919,395	34,275,410
February	47,009,070	44,162,496
March	84,973,869	49,211,663
April	80,478,835	49,781,211
May	82,398,724	46,597,830
June	63,886,110	47,778,544
July	39,197,238	38,575,576
August	67,191,023	51,205,812
September	90,578,701	51,576,590
October		50,289,449
November		51,016,335
December		62,092,302

YEARLY TOTALS OF TRANSACTIONS

	Shares of Stock
1919	316,787,725
1920	226,640,400
1921	172,712,716
1922	258,652,519
1923	236,115,040
1924	281,991,597
1925	461,404,733
1926	450,845,255
1927	576,563,218
1928	859,441,300 **

* To October 8th only.
** Total up to December 8th.

THE MONEY MARKET

Credit.—Last year's account showed that the money market was relatively easy and that, despite the huge wave of speculation in the stock market, credit remained plentiful. In fact, there were no indications of credit stringency at any time. During 1928, however, money rates have shown a decided tendency to harden, and at various times call loan rates in New York have reached 8 to 10 per cent, and at one time 12 per cent.

Rates.—For the month of September, 1928, the latest month for which average monthly rates have been published (Babson's Tables), the average rate on four to six months' prime commercial paper at New York was 5½ per cent as compared with an average rate for the same month in 1927 of 4½ per cent. For the first eight months of this year, the average stood at 4⅝ per cent as compared with the similar average in 1927 of 4¼ per cent, 4¼ per cent in 1926, 4 per cent in 1925, and 4½ per cent in 1924. These averages compare with the full yearly averages of 5⅛ per cent, 4½ per cent, 6¾ per cent, and 7½ per cent for the years 1923, 1922, 1921, and 1920.

The tendency toward tighter money conditions is more noticeable in the field of call loans. Here the September average in 1928 stood at 6½ per cent, as compared with the similar average of 5½ per cent in 1927, 5 per cent in 1926, 4¼ per cent in 1925, and 2 per cent in 1924. Following September, however, and particularly in November and December, quotations in the daily press carried much higher rates than the September average, the rate occasionally rising to 10 per cent, and at one time to 12 per cent. For the first eight months of 1928, the average New York call loan rate was 5⅝ per cent as compared with 4⅛ per cent for the corresponding period in 1927, 4⅜ per cent in 1926, 4 per cent in 1925, 3½ per cent in 1924, 4⅛ per cent in 1923, 4⅛ per cent in 1922, 6⅜ per cent in 1921, and 8 per cent in 1920.

MONEY RATES

(Source of data—Babson's Statistical Service)

	New York Monthly Average				Average Bank Rates: England France and Germany		Gold Movements	
	1928		1927					
	Dom.	Call	Dom.	Call	1928	1927	1928	1927
January	4⅛	4¼	4¼	4¼	5⅛	5½	$13,766,000 *	$44,465,000
February	4⅛	4⅜	4⅛	4¼	5	5½	11,120,000 *	19,895,000
March	4⅛	4½	4¼	4⅜	5	5½	94,853,000 *	10,757,000
April	4⅜	5⅛	4¼	4¼	5	5	91,150,000 *	11,911,000
May	4½	5⅝	4¼	4¼	5	4⅞	81,721,000 *	31,702,000
June	4⅞	6⅛	4⅜	4¼	5	5½	79,931,000 *	12,771,000
July	5¼	6⅛	4¼	4	5	5½	63,859,000 *	8,935,000
August	5½	6⅞	4⅛	3⅝	5	5½	747,000	6,353,000
September	5½	6½	4⅛	3⅞	5	5½		11,465,000 *
October			4⅛	3⅞		5½		8,642,000 *
November			4⅛	3½		5½		53,184,000 *
December			4⅛	4⅜		5½		67,418,000 *

* Exports exceed imports.

INSTALLMENT SELLING

By Robert A. Love

Lecturer in Economics, College of the City of New York

APPLICATION TO SELECTED COMMODITIES

General Developments.—One of the most significant facts in connection with installment selling is that, from consumer to banker, this plan of merchandising is now recognized as an integral part of our economic life. In

short, installment selling has settled down to a more or less normal existence. Volume of business is not increasing by leaps and bounds. It is doubtful whether the aggregate for this year will be far in excess of that of former periods. Interesting developments are not to be found in the element of growth where interest was once centered, but rather in specific changes in respect to certain aspects of the business.

Automobiles.—Trade practices have in the main remained stationary. The consensus of opinion seems to be that this year's volume was kept up chiefly by drastic changes in mechanical equipment and in styles of this season's models, and that otherwise sales and the consequent volume of automobile installment paper would have declined appreciably. Even so, all of the enormous production did not find its way into domestic use, so that factory output is not indicative of domestic volume. Also, a large proportion for cash is reported from certain sections and this, of course, lessens the amount of installment paper. The attractive features of this year's models probably help to explain the fact that the "trade-in" evil was, according to some authorities, worse in 1928 than ever before. At the same time, more stable dealers, assisted by the parent companies, are gaining greater efficiency in coping with this as well as with other problems arising more directly out of the installment business.

Radios.—The introduction of the A C set, the elimination of batteries and accessories, and other steps in the direction of mechanical perfection, have served to improve the status of the radio as a subject for installment selling, which, as a result, has been getting nearer to the methods in vogue, let us say, in the sale of talking machines. Down payments have been lowered, the time which is allowed for completing payments has been lengthened, and financing charges have been decreased.

Electrical Equipment.—Total sales in the field of electrical appliances, and especially in that of electrical refrigeration equipment, increased considerably over the preceding year. Furthermore, of the total sales, there was a marked increase in the proportion which was made on the installment basis. Evidently what has happened is, that as the market for this product broadens, an increasing proportion of the total is bought by poorer families, accustomed to installment buying.

Clothing.—The end of the year finds the Ten-Payment-Plan still in existence and probably in use by more dealers than ever before. Most of its users agree that the plan increases volume; but, during the three years since the plan was first adopted, there has been doubt as to whether the advantages offset certain disadvantages in the way of loss of prestige, cost of collections, etc. Apparently, many dealers who would like to discontinue this plan of selling find it difficult to do so.

Home Improvements.—During the past few years, a number of attempts have been made to apply the installment plan to roofing, electric wiring and fixtures, garages, and other types of improvement. The fact that a large part of the selling price is made up of labor charges for installation and that, in most instances, the goods cannot be repossessed, helps to explain the fact that the installment plan has by no means met with uniform adoption on the part of those selling such equipment. It seems highly probable, however, that the future will see an increased volume of time sales among goods of this type.

Plumbing.—In plumbing, where the question of installment selling has for some time been one of contention, the plan has come to be used quite extensively in financing large installations.

Income Producing Machinery.—The financing of machinery on an installment basis is apparently on the increase. Several finance companies have plans which are designed solely for this line of trade.

Coal.—There have been quite a few scattered attempts to sell coal on the installment plan, especially for the purpose of offsetting the summer

slump in sales. This industry apparently awaits the action of the larger producers in offering a price differential sufficiently high to induce summer purchases.

Yachts.—A company for the purpose of financing installment-sold yachts was considered during the year, but interest sufficient to justify such a project was not found.

Aeroplanes.—Probably no more than a dozen machines have been sold on the installment basis and most of these to transportation companies. The risk, together with other considerations, makes it improbable that installment selling of aeroplanes will be practiced on a wide scale.

Oil Burners.—Oil burners have been sold quite extensively on the installment plan. The oil companies, in addition to utilizing that scheme as a means of increasing their sales of burners and thus encouraging the consumption of oil in preference to other fuels, have attempted to make the installment plan contribute a still further service. By means of an ingenious arrangement, the seller binds the purchaser by contract to buy fuel from him.

THE STATUS OF INSTALLMENT FINANCING

Competitive Conditions.—Competitive conditions among the finance companies have become more intense because of the want of new fields for operations. The evils of arrested development were accentuated by the absence from the market of the Ford car, which had previously formed the basis of not a little of the installment paper. Nor was the tension decreased when Ford resumed production as he started his own discount company. Financing has, in short, reached the stage at which competition no longer permits the bountiful profits experienced formerly. Rates, although probably in line for further reductions, have nevertheless reached a point where the more inefficient organizations have begun to drop out, resulting in a material reduction in the number of acceptance companies. The larger firms, whose operations are national in scope, seem to have had the advantage over the smaller, whose activities are localized. While the latter group will doubtless continue to render service of which the larger companies are not capable, the members have not, during the current year, demonstrated ability to grow. Large corporations, on the other hand, have expanded their activities and enlarged their scale of operations. The Commercial Investment Trust, for example, has made two important additions to its operating capital. The General Motors Acceptance Corporation will enjoy the largest year's business in its history with a volume estimated at approximately $1,000,000,000.

Diversification.—In a survey covering the nature of the business of a group of 1010 finance companies, the National Association of Finance Companies recently found that 464 were financing motor vehicles exclusively, 402 motor vehicles and other merchandise, while 130 were financing other merchandise exclusively. Thus, over half of the finance companies were financing merchandise other than automobiles. While it is undoubtedly true that the discount companies have not yet reached the maximum of their business as far as financing other products is concerned, it is evident that commodities other than the automobile are gradually making for themselves a place in the financing field.

Foreign Expansion.—One of the most interesting of the recent developments in the installment business has been the extension of American financing into foreign fields. In this development, finance companies have been led by producing organizations. Thus, the General Motors Acceptance Corporation has been called upon to finance the sales of General Motors abroad. In a similar way, other large discount companies have followed the manufacturer into foreign markets. As a result, American finance companies are beginning what promises to be an extensive foreign business covering a varied line of products.

Dealer-Finance Company Relationships.—During the current year, the

shift over to the recourse method has continued until now the bulk of the financing business, especially that done by the larger corporations, is on this basis. Similarly, there appears to be on the part of an increasing number of finance companies a tendency to assume more and more of the duties which were formerly undertaken by the dealer. The task of making the credit analysis and of collecting are being taken over by the larger financing concerns and their branch offices. That these trends are manifesting themselves in the new lines was shown by a recent investigation conducted by the National Association of Finance Companies. The result for the group of property improvements, for example, show that 85% of the discount companies in this line are resorting to the recourse method, 95% assume the task of credit investigation, and 78% do the collecting.

Manufacturer - finance Company Relationship.—In deciding what action to take in connection with financing, manufacturers have been forced to the choice of leaving this function to independent concerns, of entering agreements with existing firms, or of setting up their own discount companies. The year has witnessed an increasing dissatisfaction with the first of these methods. The notable success of the General Motors Acceptance Corporation and the enviable manner in which the work of this organization has assisted the producing company, has not failed to impress others in the manufacturing line. So specialized has the business of financing become, however, and so difficult the task of initiating an organization which can meet existing competition, most producing firms have deemed it wise to delegate this function to existing finance companies. To be sure, Ford has set up his own discount company, but General Electric and Westinghouse have turned their financing business over to specialized agencies. Thus, the major portion of installment financing is now fostered by the producing firms, through some arrangement with existing finance companies. In many of these contracts, the manufacturers themselves are assuming some of the responsibilities.

Operating Experience.—The year has been fairly satisfactory especially from the point of view of the larger companies whose reports show that collection experience was better than for the previous year. This is particularly significant because the used-car paper, on which collections are normally most difficult, probably constituted an increased proportion of the whole. No unusually noticeable loss records are in evidence. Interest rates, one of the principal costs of financing, have been high. At the same time, it may be observed that a major portion of the working capital of the larger finance companies is not subject to influence by short-time interest rates and consequently costs of operation are not materially affected by temporary fluctuations in money rates. It is probable, therefore, that other economies have entirely offset this one item of increased cost, and that the annual statements of the larger companies will show satisfactory profits.

VOLUME OF BANKING TRANSACTIONS

By S. S. Huebner

Wharton School of Finance and Commerce, University of Pennsylvania

CHECK CLEARINGS

Value as Business Barometer.—As explained in previous issues (The American Year Book), check transactions are generally regarded as an excellent barometer of business conditions in that the published figures are sufficiently complete to represent the entire nation as well as all lines of business endeavor. Viewed from that standpoint, bank clearings for 1928 reflect a condition of business

prosperity approximately equal to that prevailing during the previous year.

Record Check Turnover.—For the first eight months of 1928, check transactions greatly exceeded any previous year for the corresponding period. The total stands at $545,862,994,000 as compared with $461,838,326,000 for the same period of 1927, $431,330,102,000 for 1926, $392,094,011,000 for 1925, and 339 billions, 321 billions, 302 billions, 266 billions, and 321 billions, respectively, for the years 1924, 1923, 1922, 1921, and 1920. For the first eight months of 1928, the total exceeds that of the corresponding period of 1927 by over 18 per cent, whereas the total for this period for 1927 exceeded that of the previous year by nearly 10 per cent. As compared with the last pre-depression year—namely, 1920—the total for the first eight months of 1928 is larger by 70 per cent. But allowance must be made for three important factors; namely, (1) the normal increase in the nation's business development, (2) the increased use of clearing facilities, and (3) the enormous speculative activity on our leading stock exchanges. When this is done, the total of banking transactions would seem to indicate a volume of business activity, other than security market activity, approximately the same as that of the year before, or even slightly less.

DISTRIBUTION OF CHECK TRANSACTIONS

In New York City.—Owing to the importance of New York City as the nation's center of speculative activity in the security market, and the unprecedented volume of stock exchange transactions during the current year, it is important to note the volume of bank clearing for this center, as distinct from the rest of the country. For the first eight months of the year, New York bank clearings totaled $323,097,729,000, or 100 billions (46 per cent) in excess of the total for the rest of the country. As compared with 1927, New York City clearings for 1928 (for eight months) increased by over 70 billions, while the increase for the rest of the country was less than 14 billions. This disproportionate increase simply reflects the huge transactions of the year on the New York security markets, the volume of such transactions on the New York Stock Exchange for 1928 (first eight months) exceeding by far the record of any previous years, the total being 522 million shares. This total is nearly equal to the twelve months' record of 1927 (576 million shares), and greatly exceeds the full year's previous record, *viz.*, 451 million shares in 1926.

Outside of New York City.—The preceding figures clearly indicate the importance of considering separately the banking transactions of the country after New York City is excluded. If this is done, an entirely different showing presents itself. Exclusive of New York City, the eight months' total for the nation stands at only $222,765,265,000, as compared with $209,960,063,000 for the corresponding period of 1927. The increase of less than 14 billions amounts to only slightly over 6 per cent. Moreover, the 1927 total (first eight months) compares with $205,014,872,000 for the same period in 1926, thus showing an increase of only about 2½ per cent. The figure for 1928, therefore, excluding New York City, indicates, as was explained last year, the maintenance of a high level of business activity, but without any increase of moment as compared with 1927. In fact, if allowance is made for the normal increase in the nation's volume of business as well as the normal increase in the use of checking facilities, the conclusion is warranted that the general business activity of 1928 is approximately the same as that of 1927, or even slightly less.

Comparisons.—Currently published figures (as furnished by the *Commercial and Financial Chronicle*) indicate that the record of the first eight months is being maintained. Clearings for the month of October for the various Federal Reserve districts show the following increases or decreases as compared with October of 1927: Boston district (14 cities) —3.3 per

cent; New York (14 cities) +27.9 per cent; Philadelphia (14 cities) +7.9 per cent; Cleveland (15 cities) +11.3 per cent; Richmond (10 cities) +1.9 per cent; Atlanta (18 cities) —5.4 per cent; Chicago (29 cities) +17.2 per cent; St. Louis (10 cities) +5.8 per cent; Minneapolis (12 cities) —3.4 per cent; Kansas City (10 cities) +12.8 per cent; Dallas (12 cities) +12.3 per cent; and San Francisco (28 cities) +14.5 per cent.

In considering these figures, the preponderate importance of New York should again be noted. That district's total of $35,971,164,285 for October, 1928, compares with only $28,116,837,692 for October, 1927, or an increase of 27.9 per cent. All the remaining districts show an increase for this month of only $1,786,270,926; namely, from $20,749,082,802 for October, 1927, to $22,535,423,728 for October, 1928, or 8.6 per cent.

CHECK TRANSACTIONS

(Source of data—Babson's Reports)

	Exclusive of New York		Inclusive of New York	
	1928	1927	1928	1927
January	$28,655,144	$26,933,959	$66,535,718	$58,191,843
February	25,004,091	23,662,885	57,744,977	51,102,288
March	24,458,725	27,426,633	74,245,018	61,918,813
April	28,704,178	27,045,341	70,482,021	59,052,316
May	29,929,252	26,089,186	75,199,164	57,359,325
June	31,903,264	27,176,572	77,358,569	60,184,823
July	27,408,041	26,363,394	62,492,679	57,113,373
August	26,702,570	25,262,093	61,804,850	56,915,545
September		26,754,366		60,123,236
October		28,783,404		62,874,236
November		27,247,599		60,529,267
December		30,444,653		69,382,914

YEARLY TOTALS OF CHECKS

	Exclusive of New York	Inclusive of New York
1928	$222,765,265 *	$545,862,994 *
1927	323,190,085	714,747,979
1926	309,363,401	648,418,649
1925	292,394,131	605,760,384
1924	260,310,695	523,957,472
1923	256,556,999	495,097,836
1922	222,152,058	463,987,457
1921	199,087,442	405,976,001
1920	242,069,771	484,500,290
1919	210,547,763	457,970,614

* Total for first eight months only.

FOREIGN TRADE

By Roland L. Kramer

Assistant Professor, University of Pennsylvania

TRADE EXPANSION

Commodity Movements.—Foreign trade for the fiscal year ended June 30, 1928, continued to support the expanding volume which has been consistently maintained since the recovery from the general post-war depression. The commodity movements for the year 1927-28 were particularly gratifying for the reason that small reductions in value were attributable to price recessions and actual increases in quantity were probably recorded.

Merchandise exports and imports aggregated $4,877,000,000 and $4,146,000,000, respectively. These figures represent a decline of 1.8% and 2.5% respectively as compared with the preceding year. The reduction in exports is partly traceable to a decrease in the value of cotton and coal exports and to price recessions in provisions. On the import side, there were decidely lower prices prevailing during the year for some of the leading crude materials. Total trade thus reaching the sum of $9,023,000,000 at the present level of prices represents an immense volume of international commerce. Exports in general have maintained the high levels of the last four years, but imports manifest a declining trend from the post-depression peak of 1925-26. Statistics for the trade of the first nine months of the calendar year 1928 indicate a further increase in exports and a continued shrinkage in imports as compared with the same period of 1927.

Gold and Silver.—The outward movement of gold recorded an unprecedented volume in this trade. Whereas the year 1926-27 witnessed a net gold import of $148,000,000, the year 1827-28 recorded a net export of $498,000,000. Over half of this enormous amount went to France while Argentina took more than one-quarter. The U. S. Department of Commerce explains that this gold export was primarily for the purpose of accomplishing currency stabilization in the importing countries. Silver, which completes the visible items in the foreign trade of the United States, showed an export balance of $20,000,000.

BALANCE OF TRADE

Visible Items.—Compiling these factors, the foreign trade for the year 1927-28 showed an export balance of $1,249,000,000, viz:—

Merchandising exports	$4,877,000,000
Total imports	4,146,000,000
Merchandise export balance	731,000,000
Gold export balance	498,000,000
Silver export balance	20,000,000
Visible export balance	$1,249,000,000

This export balance of visible items is the greatest recorded in the United States since the fiscal year 1920-21.

Invisible Items.—In recent years the invisible items in the international balance have become of increasing importance. These are sufficient to support this "favorable" balance of visible trade. Although statistics of the invisible accounts are computed on the basis of calendar years, it is possible to state the volume of new foreign investments for the fiscal year.

New Foreign Investments.—The par value of foreign securities publicly offered in the United States during the year 1927-28 was nearly $1,851,500,000. Since this has the effect of an import, the significance of this one item alone in connection with the visible export balance of $1,249,000,000 is readily discerned.

COMMODITY CHARACTER OF FOREIGN TRADE

The commodity character of the foreign trade during the year, according to the economic classes which are recognized, is indicated by the following tabulation:

1927-28	Crude Materials	Crude Foodstuffs	Mfd. Foodstuffs	Semi-Mfres.	Fin. Mfres.
Export	24.6%	7.7%	9.6%	14.9%	43.2%
Imports	37.2%	13.1%	10.2%	18.0%	21.5%

The greatest changes to be noted as compared with the year 1926-27 are the decline in relative importance of crude materials and a corresponding increase in the position of finished manufactures in the export trade. Foodstuffs also marked a decline.

Exports of crude materials registered a decline from 27.1 per cent to 24.6 per cent. This is traceable chiefly to the curtailment of cotton and of coal exports. "Coal exports were less than one-half as large as in 1926-27, but this was to be expected, as ship-

ments in the earlier year were enormously expanded as a result of the British coal stoppage. Cotton exports were about 30 per cent smaller than in 1926-27, owing to the decrease in the American crop, but the total value of cotton exports decreased only 5.4 per cent because of price advances. Crude petroleum exports, on the other hand, increased about 10 per cent in quantity but were 7 per cent lower in value than in 1926-27."

Exports of finished manufactures increased both in aggregate value and in relative importance, and further reflect the industrial expansion of the United States. In the pre-war period of 1910-1914, the average of finished manufactures in the export trade was 30.7 per cent, while it had risen to 43.2 per cent in 1927-28. This also represented an increase of 4.3 per cent as compared with 1926-27 or a value increment of $85,000,000. Prominent in this change is the trade in automobiles, parts and accessories, which registered the sum of $425,-100,000,—an increase of 18.2 per cent compared with 1926-27. Petroleum products recorded a decline of 12.8 per cent in value, in spite of a quantitative increase of 10 per cent. Industrial machinery was 9.6 per cent ahead of the 1926-27 figures, with $210,500,000, and cotton manufactures advanced 6.1 per cent.

Foodstuff Exports.—The decline of 7.8 per cent in the export value of manufactured foodstuffs and of 3.8 per cent in crude foodstuffs, as compared with 1926-27, was traceable to a combination of quantity and valuation recessions. Leading items in the packing house products declined heavily in value and less drastically in volume. Since these constitute one-half of the exports of manufactured foodstuffs, the effect of this trade movement upon the entire group is marked. In crude foodstuffs, the decline in value and to a less extent in quantity of exports of wheat, as well as of fruits, led to the small reduction of this group as compared with 1926-27.

Crude materials imports declined in relative importance from 38.8 per cent to 37.2 per cent. The chief reason for the decrease in the value of this group during the past year was the marked decline in the average prices of crude rubber, raw silk, unmanufactured tobacco, crude petroleum, and many other of the leading imported materials. On the basis of quantity, there was an increase in imports of silk, crude petroleum and hides and skins, the last registering an increase of 44 per cent. On the other hand, rubber, wool and cotton decreased in the import trade.

Finished manufactures imports showed a small increase from 20.6 per cent in 1926-27 to 21.5 per cent in the current year. This slight advance sustains the continued growth of imports of this class ever since the post-depression period.

Foodstuff Imports.—A small increase in the importance of crude foodstuffs was also registered, the percentage advancing to 13.2 per cent compared with 12.3 per cent the preceding year. This change is traceable to price increments in cocoa and a quantitative increase in coffee.

Commodity changes which reflected imperceptible alterations in the groups in which they are found were value enhancements in fertilizers and in leather; value recessions in tin, sawmill products, woodpulp and expressed vegetable oils; and quantity decreases in sugar and in copper.

GEOGRAPHICAL DISTRIBUTION OF FOREIGN TRADE

The geographical distribution of the foreign trade for the year 1927-28, computed in percentages, was as follows:—

1927-28	Northern North America	Southern North America	South America	Europe	Asia	Oceania	Africa
Exports.....	17.9	8.1	8.9	47.6	11.6	3.6	2.3
Imports.....	11.8	11.5	13.5	30.4	29.3	1.3	2.2

Foreign Markets.—Europe continues, by a wide margin, as the leading market for American exports and regains by a slight advantage its former leadership in the import trade as well. Northern North America takes second place in exports, displacing Latin America, which is third. In the import trade, Asia reverts to second place, although the margins by which these areas are separated are slight. Changes in the geographical distribution of foreign trade, compared with 1926-27 are, therefore, of little significance.

North America.—The most pronounced change in the direction of exports is found in northern North America which took 17.9 per cent of our exports compared with 16.0 per cent the preceding year. This is accounted for by the continued expansion in sales to Canada, particularly of grain, automobiles and tractors. By reason of an increase of $74,000,000 in exports to Canada, the latter country became the leading foreign market for American merchandise.

United Kingdom.—Europe declined slightly from 48.2 per cent to 47.6 per cent of our exports, thus continuing the decrease in relative importance which has consistently occurred. Sales to the United Kingdom declined as a result of smaller purchases of cotton, pork products and turpentine and the lower price of gasoline.

Continental Europe. — Germany, which was third among the countries which purchased American merchandise, registered an increase in trade by reason of higher values of barley, cotton and furs. Decrease in coal exports as a result of cessation of the British coal strike accounted for part of the decline of Europe in the export trade. Higher cotton prices and increase in automobiles caused greater exports to Italy and Sweden, respectively, and together they explain most of the expansion in exports to Spain.

Latin America. — Latin-American purchases showed a slight decline of .5 per cent in relative importance compared with the preceding year. Argentina, which was sixth in the export trade, registered a substantial increase principally because of larger sales of automobiles, cotton yarn and gasoline. Colombia, Venezuela and Central America were the only other Latin-American countries to which our exports were greater than during the preceding year. The decline in sales to other countries in this area is difficult to trace.

Asia.—In the trade with Asia, decreases in exports to Japan and India were recorded. Smaller shipments of cotton are probably accountable for a large share of this decline. Chinese purchases also fell off, while the Philippine Islands showed an increase over the preceding year.

Australia registered a serious decline as a result of decreased sales of gasoline, agricultural machinery, pianos and other manufactured products, particularly automobiles.

Imports from Europe showed a slight advance over the preceding year and placed this continent at the head of the list by only a slight margin over Asia. The United Kingdom was the second leading source of American imports and in common with Germany, France and Belgium, increased in volume of trade over the preceding year.

Imports from Asia.—The decrease in the value of imports from Asia was entirely due to the lower value of imports of rubber and of silk. The countries affected by this decline were British Malaya, Ceylon, the Netherland East Indies, Japan and China. On the other hand, imports from British India marked a small increase due partly to a larger trade in burlaps.

Imports from Latin America.—In the Latin-America area, imports from Argentina expanded considerably by reason of increased purchases of cattle hides; and larger imports of petroleum accounted for a greater trade with Venezuela and the Netherland West Indies. Enhanced imports of coffee accounted for a small net increase in Brazilian trade, while the decrease in coffee imports from Colombia led to a decline in purchases from that source. Imports from Cuba fell off considerably as a result of

smaller purchases of cane sugar and of cigar leaf. Increases in the imports of nitrates probably accounted for the small expansion in purchases from Chile.

Canada continued to lead all other countries in the import trade of the United States. A moderate increase in this trade is traceable to enhanced imports of newsprint, cattle hides and calf skins.

COMMERCIAL TREATIES AND CONVENTIONS

Honduras, Latvia, Persia.—Treaties of friendship, commerce and consular rights were entered into during the year with several countries. The treaty with Honduras was signed December 7, 1927; ratifications were exchanged on July 19, 1928, and the treaty was proclaimed on July 23, 1928. The treaty with Latvia was signed on April 20, 1928; ratifications were exchanged and the treaty was proclaimed on July 25, 1928. A provisional agreement with Persia, relating to commercial and consular rights, was signed on May 14, 1928, effective retroactively from May 10, 1928.

Turkey.—The temporary agreement with Turkey whereby equality of treatment in customs matters is reciprocally granted, was extended from February 20, 1928, to May 20, 1928, and from the latter date was extended for a period of ten months and twenty days. This arrangement was consummated by exchange of notes May 19, 1928.

Austria.—Commercial agreements which have been negotiated during the year and are awaiting ratification are treaties of friendship, commerce and consular rights with Austria, signed June 19, 1928, and with Norway, signed June 5, 1928.

China.—The important treaty with China whereby tariff autonomy would be restored to the latter was signed on July 25, 1928, and is awaiting ratification.

International Convention. — The United States became a party to the International Convention for the Abolition of Import and Export Prohibitions and Restrictions which was proposed at the World Economic Conference in May, 1927, at Geneva. The United States took this action on January 30, 1928, and on July 31, 1928, the Supplementary Agreement was also entered into. This Convention "affects neither the tariff systems nor the treaty making methods of the participating countries nor the measures taken to insure their application." The Chamber of Commerce of the United States further declares that the United States interpreted the Convention "as excluding from the Convention measures to counteract dumping, bounties, subsidies, unfair methods or acts in foreign trade, undervaluation, or discrimination—characteristic features of our tariff legislation."

RAILROAD TRAFFIC AND EARNINGS

By G. Lloyd Wilson

Professor, University of Pennsylvania

THE SITUATION AND OUTLOOK

The year 1927 was of mixed trends in railroad traffic and earnings. Property investment increased approximately $750,000,000, while operating revenues fell off $250,000,000. The operating ratio increased nearly 1.5%, and the rate of return fell more than half of one per cent under 1926. Freight revenues decreased more than $160,000,000 and the amount of freight carried decreased more than 100,000,000 tons under the previous year. The average amount received per ton mile decreased slightly below the 1926 level. Passenger revenues continued to decrease along with the number of passengers carried and the average amount received per passenger mile. Conditions in 1928 have not improved materially. Operating revenues have decreased but greater de-

creases in operating expenses indicate an improvement in operating income.

RAILROAD MILEAGE

Class I steam railroads, those earning railway-operating-income exceeding $1,000,000 per annum, operated an average of 238,281.59 miles of road in 1927 compared with 236,943.63 miles in 1926. Carriers of the same class operated 240,203.36 miles during the first eight months of 1926. The progress in railroad mileage operated carries forward the conservative annual expansion policy of the years following 1920.

Year	Average Miles of Road Operated
1921	235,162.74
1922	235,146.13
1923	235,282.64
1924	235,687.40
1925	236,578.80
1926	236,943.63
1928 (first eight months)	238,281.56

New Construction Permits.—The Interstate Commerce Commission has continued its previous policy of conservatism in granting carriers permission to construct additional new mileage, to acquire and operate existing mileage or to abandon mileage operated. The amount of mileage covered by such permissions to construct or operate has more than offset the decrease in mileage due to the permitted abandonment of lines because of the exhaustion of resources, shifting of population, competition of other instrumentalities of transportation, or other causes.

RAILROAD EQUIPMENT

Condition of the equipment of Class I carriers continued to be good in 1928 following a very fine record of equipment condition and performance in 1927. Class I carriers handled the peak traffic of October, 1928, with a comfortable surplus of active locomotives in good repair available for service and an adequate reserve supply of stored locomotives. Heavy tonnages including the grain crops were handled without car shortage. On October 31, 1928, there was an available surplus of 105,017 freight cars in good condition reported by the American Railway Association.

Motive Power Changes.—The replacement of obsolete passenger and freight locomotives with new motive power equipment of improved design, greater fuel economy, increased speed and greater tractive power continued in 1928. An increase was also noted in the number of Diesel-electric, gasoline and gas-electric locomotives and self-propelling cars. The latter were installed principally on branch lines where light traffic makes standard steam train operation costly. The tractive effort of all locomotives in service reached 2,605,346,503 pounds, an increase of 265,000,000 pounds since 1920.

Passenger Coaches.—Progress was also made in the improvement in size, comfort and construction of railroad passenger train equipment. Wooden and part wood and steel coaches of small size and limited conveniences continued to be replaced with larger all-steel cars equipped with improved lighting, heating, ventilating and seating accommodations. At the beginning of 1928, 53,804 passenger train cars were in service, a decrease of nearly 1,000 below the number in service in 1927, but an increase of more than 300 over the number in service in 1920.

Freight Cars.—A further advance was made in the average carrying capacity of freight cars. Wooden box and gondola cars continued to be retired and replaced by larger all-steel equipment. The average carrying capacity of all types of freight carrying cars in 1928 was approximately 46 tons, an increase of 3 tons per car since 1920.

Busses and Trucks.—Railroads continued to increase the number of motor passenger busses and freight trucks operated by the carriers, usually through subsidiary operating companies or through contractural arrangements with independent operators in local line haul and terminal passenger and freight services.

OPERATING REVENUES

Class I Roads.—The operating revenues of Class I railroads for the first

nine months of 1928 showed a decrease in railway operating income compared with the returns for the corresponding period of 1927, accounted for by decreases in the volume of freight, passenger, mail and express traffic, by certain reductions in freight and passenger charges and decreases in other items for operating revenues.

Totals of All Roads.—The railway operating revenues from all sources amounted to $4,434,169,967 for the first nine months of 1928 as compared with $4,658,184,419. Operating expenses also decreased from $3,474,911,963 for the first nine months of 1927 to $3,341,042,186 for the corresponding period of 1928. Total operating revenues amounted to $6,138,725,622 for the full calendar year 1927, and the total operating revenues for the complete year 1928 will probably amount to about $6,000,000,000, or 1.9%.

Revenue from Classified Sources.—Revenues from freight traffic were 58,074,692 lower in the first eight months of 1928 than for the same months of the preceding year. Passenger revenues, including sleeping and parlor car surcharges, fell 8% during the same period, a decrease of $52,905,209. Revenues from the mail service increased from $62,496,488 during the first eight months of 1927 to $64,286,488 in the same period of 1928, an increase of 2.9%. Express revenue increased slightly from $88,699,464 to $88,911,120, during the same period. Revenues from all other transportation sources decreased more than $5,609,368 from $239,572,398 in the first eight months of 1927 to $223,963,030 in 1928. General decreases of this sort indicate a reduction of more than $125,000,000 in railway operating income in 1928 compared with 1927.

Expenditures.—The decreases in revenue are not offset entirely by reduction in railway operating expenses. Expenditures of Class I railroads for maintenance of ways and structures decreased from $585,950,186, for the first eight months in 1928 to $562,896,829 for the same period in 1927. Maintenance of equipment expenses decreased from $825,184,578 during the first eight months of 1927 to $781,834,848 during the same period in 1928. Traffic expenses rose from $80,582,807 in the period of 1927 to $83,582,807 for the corresponding period of 1928. Transportation costs fell more than $60,000,000, from $1,440,882,651 in 1927 to $1,380,610,490 in 1928. General operating expenses increased slightly from $128,288,124 in 1927 to $128,971,098 in 1928. All other operating expenses decreased from $27,416,427 in 1921 to $27,286,532 for the first eight months of 1928.

Net revenue from railway operations for the first eight months of 1928 was $8,319,389 more than the revenues for the same period of 1927,—$1,004,410,857 in 1927 and $1,012,730,246 in 1928. Total operating expenses amounted to $4,092,715,675 for the first eight months of 1927 and to $3,978,125,944 in 1928, a decrease of 2.8%.

Railway tax accruals were lower in the first eight months of 1928 than for the corresponding months in 1927,—$249,711,549 in 1928 and $252,109,084 for the corresponding period of 1927.

Net railway operating income for the first eight months of 1928 amounted to $685,652,013, as compared with $676,864,661 in 1927, an increase of $8,787,352 or 1.3%, indicating that the net railway operating income for the calendar year 1928 will be greater by some $10,000,000 than the 1927 income of $1,068,513,157.

The railway operating ratio, the percentage relationship between operating expenses and revenue, was 74.54% for the first eight months of 1928 as compared with 75.46% for this period in 1927, and 74.54% for the calendar year 1927.

RAIL BORNE TRAFFIC

Freight Loadings.—Railroad freight traffic in 1926 was the greatest on record in the United States, an increase of four per cent in the number of carloads over 1925, 53,310,000 carloads of revenue traffic in 1926, and 51,224,000 in the previous record year

of 1925. A new record was also established in net ton-miles of revenue freight hauled, seven per cent over the previous record made in 1925:—443,848,000,000 net ton-miles in 1926 and 413,937,000,000 in 1925. The number of carloads decreased in 1927 to 51,714,302 carloads. Revenue tons of freight hauled declined from 2,467,111,788 in 1926 to 2,364,899,801 in 1927, and ton-miles declined to 428,793,000,000 ton-miles in 1927.

Freight Volume.—Reports for the months thus far available indicate a lighter traffic in 1928 than in 1927. Complete figures are not available until months after the close of the year, but the preliminary figures for the first eight months of the year tend to show a loss in revenue carloads of freight hauled below the 1927 level. The volume of freight handled during the first eight months of 1928 amounted to 305,381,025,000 net ton-miles, a decrease of 2.9% below the corresponding period of 1927.

Passenger traffic of Class I railroads fell from 35,962,067,000 passenger miles in 1925 to 35,488,825,000 in 1926 and to 33,657,499,000 in 1927, continuing the steady decline since 1923. The figures for 1928 so far compiled tend to show a still further decrease due to the competition of private motor cars and passenger busses operating over an increased system of improved highways and to the great increase in foreign travel by American tourists.

Transportation Receipts.—Receipts from transportation services, passenger and freight, per unit of service rendered fell a little more in 1927 compared with 1926, compared also with the highest year following the war, 1921. Receipts per ton-mile of freight hauled averaged 1.276% in 1921, the year following the horizontal rate increase of 1920. Passenger fares in that year averaged 3.086¢ per passenger-mile. In 1926, the average receipts were 1.082¢ per ton-mile and 2.936¢ per passenger-mile, while in 1927 these average figures fell to 1.081¢ and 2.896¢ respectively. The average receipts for the five-year period 1921-1925 were 1.149¢ per freight-mile and 3.011¢ per passenger-mile. The prediction is made that the figures for receipts for passenger and freight transportation in 1928 will show a slight decrease below the 1927 levels.

Operating Efficiency. — Although volume of traffic and earnings from both passenger and freight traffic are below the levels of 1926 and 1927, the efficiency of railroad operation has improved appreciably. The first eight months of 1928 have been marked by improved records in a number of selected items of railroad freight service operating averages.

RAILROAD OPERATING AVERAGES

CLASS I STEAM RAILROADS

1. Net ton-mile per mile of road per day.
   First eight months, 1928—5,256.
   Best record of comparable period—5,463 (1927).
   Record in 1920—5,179.
2. Gross trainload, excluding locomotives.
   First eight months, 1928—1,814.
   Best record of comparable period—1,814 (1928).
   Record in 1920—1,433.
3. Net trainload.
   First eight months, 1928—779.
   Best record of comparable period—779 (1928).
   Record in 1920—708.
4. Gross ton-miles per train-hour, excluding locomotives.
   First eight months, 1928—23,396.
   Best record of comparable period—23,396 (1928).
   Record in 1920—14,833.
5. Net ton-miles per car-day.
   First eight months 1928—505.
   Best record of comparable period—515 (1927).
   Record in 1920—483.
6. Average carload in tons.
   First eight months 1928—26.5.
   Best record of comparable period—28.8 (1920).
7. Car-miles per car-day.
   First eight months 1928—30.3.
   Best record of comparable period—30.3 (1928).
   Record in 1920—24.0.
8. Per cent loaded of total.
   First eight months 1928—62.9%.
   Best record of comparable period—69.9% (1920).
9. Cars per train, including caboose.
   First eight months 1928—47.8.
   Best record of comparable period—47.8 (1928).
   Record in 1920—36.2.
10. Pounds of coal per 1000 gross ton-miles including equivalent coal tonnage for fuel oil consumed and including locomotives.
    First eight months 1928—127 pounds.
    Best record for comparable period—127 pounds (1928).
    Record in 1920—162 pounds.

CAPITAL EXPENDITURES

Class I railroads have, since 1923, expended between $750,000,000 and $1,000,000,000 per year in improvement in plant and operation, an average annual outlay of nearly $900,000,000. In 1927, $771,552,000 invested in locomotives, passenger-train cars, freight-train cars, equipment other than these classes, additional track, heavier rail, additional ballast, shops, engine-houses and machinery, and other improvements. In 1926, the capital expenditures amounted to $885,086,000. Capital expenditures based upon the expenditures of the first eight months of 1928 are estimated at $650,000,000.

Class I railroads have invested nearly $7,000,000,000 in improved facilities since 1920 as is indicated by the table below of actual expenditures 1920 to 1927 and the estimated outlay for 1928.

Year	Capital Investment Class I Carriers
1920	$ 653,267,000
1921	557,035,000
1922	429,273,000
1923	1,059,149,000
1924	874,743,000
1925	748,191,000
1926	885,086,000
1927	771,552,000
1928 (estimated)	650,000,000
Total—nine years	$6,628,296,000

CHARACTER OF TRAFFIC

Distribution.—In the first two quarters of 1928, the distribution of traffic among the major groups of commodities changed as indicated in the table below. The volume of freight originated by class I carriers amounted to 582,707,656 net tons, a decrease of 5.85% compared with the tonnage for the same period of 1927. The percentage of mineral products, forest products and all less than carload freight decreased, while increases were recorded in agricultural products, animals and animal products, and manufacturers and miscellaneous traffic.

Commodity Group	Tons Originated Two Quarters 1928	Percentage Change Compared with Same Period of 1927
Products of agriculture	45,989,359	1.03 increase
Animals and products	12,621,209	1.48 increase
Products of mines	306,900,474	10.96 decrease
Products of forests	49,409,186	4.02 decrease
Manufactures and miscellaneous	149,707,178	2.63 increase
All less than carload freight	18,080,250	4.35 decrease

TRAFFIC STATISTICS

Class I Railroads

	1920	1925	1926	1927
Revenue carloadings freight	45,118,000	51,224,000	53,310,000	51,714,000
Average weekly carloadings	868,000	985,000	1,025,000	1,000,000
Net ton-miles	410,306,000,000	413,814,000,000	443,746,000,000	428,621,000,000
Passenger-miles	46,848,000,000	35,960,000,000	35,417,000,000	33,648,000,000
Receipts per ton-mile	1.052¢	1.097¢	1.081¢	1.080¢
Receipts per passenger-mile	2.745¢	2.938¢	2.936¢	2.896¢
Operating ratio	74.3%	74.1%	73.1%	74.5%
Rate of return on investment	0.09%	4.71%	4.95%	4.27%
Railway operating revenues	$6,178,000,000	$6,126,572,000	$6,386,948,000	$6,138,000,000
Railway operating expenses	$5,827,000,000	$4,456,000,000	$4,669,000,000	$4,574,177,000
Railroad tax accruals	$ 272,061,000	$ 358,735,000	$ 389,127,000	$ 376,236,000
Net railway income	.....	$1,122,402,000	$1,213,916,000	$1,068,513,000

CONTROL OF PRODUCTION

By William F. Notz

Dean, School of Foreign Service, Georgetown University

THE MINERAL INDUSTRY

Over-Production and Remedy.—The problem of overproduction received marked attention during 1928, in the mineral industry, including copper, zinc, coal and petroleum. The conditions were characterized by George Otis Smith, Director of the U. S. Geological Survey, in an address before the section of mineral law of the American Bar Association at Seattle, July 24, 1928, as follows: "The fairly constant growth of the mineral industry would be a matter of national pride, were it not that in recent years the industry seems to have grown too fast. Control of production is the absolutely necessary next step if excessive waste and heavy loss are to be avoided. The dangers incident to an overstimulated growth and an excess capacity are not special and local but general and country-wide. The present excess of production capacity is a liability common to the balance sheet of most branches of industry." As a remedy Mr. Smith proposed: "Self-regulation to the fullest extent possible, but a supplementary public control for emergency."

THE OIL INDUSTRY

While little progress was made by the Federal Oil Conservation Board during the year towards a solution of the problem of overproduction, petroleum producers and others interested in the oil industry took the initiative in curtailing production by concerted action. At the annual meeting of the American Institute of Mining and Metallurgical Engineers in New York in February, control of production was the topic for a special program, and a technical committee was appointed on production control.

Control in the Oil Fields.—In the Oklahoma, Texas and California oil fields concerted efforts of rationalization have been in operation throughout the year. In Oklahoma conservation was effected by restriction of drilling as agreed upon by the majority of the producers and enforced by a ruling of the State Corporation Commission. In Texas different methods of prorating of new fields have been tried out with the coöperation of the State Railroad Commission. According to a prominent oil man "the uniformity of production during 1928 as compared with previous years was due primarily to curtailment of production from wells already drilled, it being estimated that the available or shut-in production at the end of the year was close to 500,000 barrels per day, which is equal to the combined production of Venezuela and Russia, which rank next to the United States in the petroleum production of the world.

RUBBER

Stevenson Restriction Plan.—The year 1928 witnessed the abandonment of two important government attempts to control the market of commodities imported in large quantities into the United States,—rubber and sugar. In April the British Government announced the discontinuance, as of November 1, 1928, of the Stevenson scheme of restriction of rubber output in the British colonies in the Far East. The Stevenson scheme went into effect in 1922. In consequence, rubber prices soared as high as $1.21 per pound in 1925, averaging 73 cents per pound for that year. This led to a large increase of rubber production in the Dutch East Indies, which rose from 95,000 tons in 1922 to 225,000 tons in 1927, with the result that whereas in 1922 Great Britain furnished 67 per cent of the world's supply, in 1928 she furnished only 55 per cent.

Rubber Prices.—Rubber sold in 1928 for about 19 cents per pound. The result has been drastic price declines due to unprecedented additions

to output in spite of the tremendous increase in rubber consumption. Meanwhile the American rubber pool which first tried to depress and then in self-defense sought to support the rubber market, still holds thousands of tons of rubber bought at 40 cents or thereabouts, and is carrying this expensive rubber with the aid of many millions of bank credits.

SUGAR

Abandonment of Restriction in Cuba.—President Machado of Cuba announced in August that in the exercise of discretion vested in him by law authorizing restriction upon the production of sugar, he had decided against any restriction of the crop then maturing. This action was taken in response to representations by a substantial majority of the Cuban sugar producers favoring abandonment of restriction upon production. However, Cuban sugar producers are not entirely free to market their crop, as under Cuban law a distinction is made between that portion of the sugar output which may be sold in the United States and that which is sold elsewhere. Under the law the latter must be sold through the medium of an official export corporation.

According to estimates by the Secretary of Agriculture of Cuba in 1928 an amount equal to 37½ per cent of the harvested crop was left uncut in the fields. This enormous sacrifice made by Cuba was nullified by increased sugar production in other parts of the world. Efforts made during 1928 to organize a consortium of the world's principal sugar producers with a view to bringing about an international restriction of sugar production failed, mainly on account of the refusal of the Java producers, the most formidable competitors of the Cubans, to agree to the proposed ratio of curtailment of production.

OTHER PRODUCTS

Coffee Valorization.—On the other hand, the Brazilian coffee valorization scheme, one of the oldest of existing methods of governmental control, was continued during the year by renewal of the existing agreement among the coffee producing states of Brazil. In spite of the 1928 bumper crop and increasing stocks, coffee prices have not only been maintained but have even advanced during the year.

Nitrate.—In August a price control scheme was reëstablished in the Chilean nitrate industry, in compliance with the Chilean law of July 25, 1927.

Quinine.—In the early part of the year agents of the United States Department of Justice at New York seized $100,000 worth of quinine in the warehouse of an importing firm under the provisions of Sections 73, 76 and 77 of the antitrust provisions of the Wilson Tariff Act of 1894, as amended February 12, 1913, which prohibit import combines. It was charged that about 95 per cent of the world's quinine crop is harvested in the Dutch East Indies and that its sale was controlled by a monopoly, the Kina concern at Amsterdam. The matter was finally settled through a consent decree in the U. S. District Court for the Southern District of New York, under which the defendants are prohibited from restraining trade in the United States in cinchona bark or quinine.

THE MERGER MOVEMENT

"Rationalizing" Industry.—Among the methods employed widely during the past year as a means of effecting improvement in the structural organization of over-developed industries is the substitution of mergers or combinations for competing units. By means of these superorganizations it is intended to stabilize production, reduce costs and increase efficiency in those lines of business which are not making satisfactory profits. These efforts to "rationalize" industry extend to the processes of distribution as well as to those of production. The movement has been sweeping through American industry with such magnitude that 1928 has been styled the "big merger year." In a recent analysis of the first thousand companies listed in *Poor's Manual of Industries* two hundred companies, or one out of every five, proved to be the result

of some form or other of consolidation or merger.

Scope of Merging.—The merger movement has been notable particularly in the oil, steel, textile, automobile, telegraph, flour milling, theatrical and banking business. Early in the year a merger in the oil industry, of the Texas Corporation and the California Petroleum Corp., involved combined assets of about $380,000,000. Among the banks, mergers are now wiping out about 350 institutions per annum, and our total number of banks is from 10 to 12 per cent less than it was five years ago.

Motor Mergers.—In the automobile industry assets estimated at $160,000,000 were involved in the combine of the Pierce-Arrow Motor Car Co. and the Studebaker Corporation. A merger of Dodge Brothers, Inc., with the Chrysler Corporation, involving $175,000,000 in assets took place on July 30th.

Telephone and Telegraph.—An arrangement was entered into in August by the American Telephone and Telegraph Co. and the Western Union Telegraph Co., the purpose of which was reported to be the elimination of duplicate pole lines and wire circuits. The A. T. & T. and its subsidiaries cover approximately three-fourths of the telephones in the United States, and the Western Union operates over four-fifths of the country's land telegraph service.

Entertainment.—A gigantic combination in the entertainment business was effected in October through a combination of the interests of the Radio Corporation of America, the Keith-Albee Orpheum Corp. and F. B. O. Producers, Inc., in the form of a holding company to be known as the Radio-Keith-Orpheum Corporation. The new combine represents a capital aggregating $600,000,000.

Foodstuffs Mergers.—In the field of foodstuffs a recent combination comprises some of the largest flour milling companies in the country, including the Washburn Crosby, Red Star Milling, Kalispell Milling and the Rocky Mountain Elevator Co. The new combine, with a capital of $50,000,000, controls mills in Minnesota, New York, Missouri, Illinois, Kansas and the Mountain states. The United Biscuit Co. of America increased its size about 30 per cent through acquisition of three other companies, the Ontario Biscuit Co., Hekman Biscuit Co. and Quality Biscuit Co. Another large merger was effected by the Postum Co., which took over twelve concerns.

Fruit.—The first conspicuous merger in the fruit industry of the Pacific Coast was effected by combining the Sun Maid Raisin Growers' Association and the California Peach and Fig Growers' Association. This combination is not one of corporate bodies but of marketing operations.

Drugs.—In the drug business a consolidation of 16 wholesale drug firms with the McKesson & Robbins Corporation of New York was reported to involve a capital of $250,000,000. A similar merger comprised the Palmolive Co., Peet Brothers and the Colgate Co. Toward the close of the year a merger of the Graselli Chemical Co., capitalized at $64,000,000 with the du Pont de Nemours & Co., whose total assets aggregate $350,000,000, was reported.

Insurance.—In the insurance business a merger of the Home Fire Insurance Co. and the National Liberty Insurance Co. of America groups, having combined assets in excess of $175,000,000, was effected on November 1.

INTERNATIONAL CARTELS

Petroleum.—Control of production played an important rôle also in several international cartels formed during 1928, in which American interests participated directly or indirectly. During the summer, conferences were held in Scotland between representatives of the Royal Dutch Shell petroleum group, the British Government-controlled Anglo-Persian Oil Co. and American oil interests for the purpose of taking joint action for the conservation of the world's petroleum resources. Plans are reported to be under way for the formation of an international petroleum cartel in the near future.

Zinc and Nickel.—Similar action

has been taken by the zinc and nickel producers of the world, the latter under the leadership of Lord Melchett (Sir Alfred Mond).

INTERNATIONAL TRADE CONTROL

By Henry Chalmers

Chief, Division of Foreign Tariffs, Department of Commerce

GENERAL TREND

Tariff Stability.—In general, 1928 was marked by a slowing up in the number of general revisions or comprehensive changes in the import tariffs of foreign countries, accompanied by some indications of a tendency toward moderation of tariffs and other restrictions on the movement of goods from one country into another. The large number of commercial treaties negotiated during the year between various sets of countries suggests a closer approach to a state of stability in the conditions of trading between nations, particularly in view of the definite adoption, almost universally, of the unconditional most-favored-nation principle.

Trade Restrictions.—While still far from receiving general adoption, the recommendations of the Geneva Economic Conference of 1927 are beginning to show their influence, in a limited way, in the movement observed toward moderation and stabilization of tariffs and trade relations. The various conferences and international studies centering at Geneva are coming to play an appreciable part in the formulation of world principles in matters of trade control, and in facilitating international agreement on more liberal and more uniform standards of practice. The most important concrete step in this field, during 1928, was the final conclusion of the Convention for the Abolition of Import and Export Prohibitions and Restrictions, which has already been signed by the representatives of 27 countries and now awaits ratification. While not particularly motivated by the Geneva discussions, along the same direction has been the termination, on November 1, 1928, of the export restrictions on crude rubber maintained for several years past in British Malaya and Ceylon and which constituted perhaps the most notable case of restriction upon quasi-monopolized raw materials in recent years.

Colonial Preference and Chinese Autonomy.—On the other hand, the year saw an accentuation of the tendency for the tying up of certain European countries with their overseas dominions or colonies, through preferential tariffs or other measures for closer relations, with some consequent disadvantage to outside countries. The announcement by the Nationalist Government of China, toward the close of the year, of the first autonomous tariff for that country, to be effective provisionally from February 1, 1929, represents a notable instance of advance in existing tariff levels.

Commodities Specially Affected.—Viewed from the commodity standpoint, the principal classes of goods that appear to have been the subject of particularly widespread change in tariffs or trade control during the past year have been wheat and other cereal products, mineral oil, motion picture films, pharmaceutical preparations, and what might be termed luxury goods. Machinery and industrial materials became subject to more liberal tariff treatment in an additional number of countries during the past year, as a means of aiding the development of local industries.

EUROPE

Tariff Changes.—Five of the 26 countries of continental Europe (France, Poland, Latvia, Norway and Finland) put into operation during 1928 more or less comprehensive revisions of their import tariffs. Compared with the 10 tariff revisions during 1927, this constitutes a significant indication of the progress in the settling-down process in European tariffs. In addition, a number of Euro-

pean countries made changes in their import duties on a limited number of commodities at various times during the past year. The majority of these duty modifications have indeed been upward, but it is notable that a much larger proportion of the European tariff changes in 1928 were downward than in earlier years. The reductions in duties were in many cases brought about in the course of treaty negotiations involving duty concessions by one or both countries on selected lists of articles. However, a number of downward changes have been autonomous, resulting from the voluntary decision of particular governments. In the most notable case, that of Germany, the reductions were partly in accordance with a definite program, contemplated during the last general revision, for the later or gradual reduction in the initial duties on particular commodities.

Trade Restrictions.—Perhaps the most noteworthy modification in European trade control during the past year has been in the matter of restrictions on imports and exports, a system which has marked the trade control régime of many countries of Europe since the war. In about 10 European countries, the year 1928 saw moderation or removal—in varying degrees—of the licensing controls or other restrictions that had hitherto governed importation or exportation, with the result that the restriction system of controlling trade has almost disappeared in Western Europe, and has been considerably limited in its scope in the countries of Central and Eastern Europe. In part, these actions are a reflection of the greater stabilization in economic conditions which makes such arbitrary controls on foreign trade less necessary; and, in part, such actions have also been stimulated by the growing general recognition, emphasized at international conferences, that restrictions have proved arbitrary, inequitable and, in the long run, unprofitable as a regular means of controlling the movement of goods in and out of a country.

Most-Favored-Nation Policy.—The progress during 1928 in the subsidence of the unsettled state of trade relations of the past decade is further seen in the particularly large number of commercial treaties or agreements concluded by European countries during the year among themselves and with their trading countries across the seas. The practice of exchanging reciprocal duty concessions in the course of many of these treaties has already been noted. The most significant feature in this field, however, has been the apparently definite reestablishment of the unconditional most-favored-nation clause as the essential governing principle in international trade relations, even Spain and France, who for a time pursued the special concession policy, having announced their intention during the past year of going over to the unconditional most-favored-nation policy. There is thus being restored the assurance, which was fairly general before the war, that treaty countries will be on a basis of equality in competing for the supplying of the import requirements of each other, the benefit of any later concessions in duty to third countries being extended to each other automatically and without additional compensation.

Liberal Treaty Provisions.—It is of further significance that the commercial treaties negotiated during the last year or so contain, with increasing frequency, provisions granting broader assurance than had hitherto been common with regard to liberal treatment of each other's trade. Particularly notable have been the undertakings to grant most-favored-nation treatment in the matter of import or export restrictions, and, in an increasing number of treaties, a definite exchange of promises not to impede the trade between the two countries through the imposition of any prohibitions or special restrictions upon their imports or exports, beyond those for purposes of public safety, health, or protection of plants or animals and the like, which are generally excepted. The propriety of indirect trade was further recognized in a number of treaties, either through provisions according goods

coming through the territory of the other country the same treatment as direct shipments, or through assurances that goods of that other country arriving indirectly through a third country will be granted as favorable customs treatment as if they had come directly.

LATIN AMERICA

Tariff Changes.—Among the countries of Latin America, as of Europe, 1928 witnessed a slowing up in the frequency of tariff changes. Only five of the American Republics can be said to have put into operation thoroughgoing or large-scale revisions of their import duties, as compared with about 12 such revisions during 1927. Of the five indicated, three countries (Chile, Haiti, Peru) actually put through general overhaulings of their tariffs during the year; a fourth (Uruguay) continued its program of gradual revision by issuing new official valuations for duty purposes covering a number of its tariff schedules; and the fifth country (Mexico) ordered so many individual changes both in import and export duties during the course of the year as to materially change the complexion of its tariff, although without a general overhauling. In addition, an appreciable number of duty changes on individual commodities were ordered during 1928 by the Governments of the countries of Latin America, as they have for a number of years past, but the number of such tariff changes was noticeably smaller than in earlier years.

Administrative Tariff-making. — The method of tariff-making in the countries of Latin America has, however, seen no appreciable change. The régime of many of these countries is marked by the fact that the executive, or a particular cabinet minister, is vested with authority to order changes in the duties on individual commodities or in other measures of trade control at almost any time, and without requiring legislative approval or prior notice. In fact, the prevalence of this practice was accentuated during 1928 by the tariff authority vested in the President of Chile in the course of the general revision of the tariff of that country.

Exemptions for Productive Equipment.—In five of the Latin American countries (Bolivia, Costa Rica, Ecuador, Guatemala and Haiti) additional measures were taken during the past year to reduce, if not completely to waive, the import duties on specified classes of machinery, equipment or materials for use in production or construction. These represent extensions of the policy followed by many of these countries of encouraging the economic development of the country, whether in agriculture, mining, or industry, through the granting of privileges in connection with the admission of the necessary machinery and materials, or the waiver of local taxes. Peru appears to have been following a regular policy of granting reduced rates of duty on importations of specified industrial materials in shipments of a given minimum quantity.

Pharmaceutical Regulations. — A considerable number of countries of Latin America appear to have taken up for reconsideration their regulations on the admission of pharmaceutical or medicinal preparations, with the revised regulations commonly requiring that such a product may not be sold in the country unless it has been previously submitted for registration, and, in some cases, also for analysis.

BRITISH EMPIRE

Tariff Changes.—The only British countries to put into operation during 1928 a sufficiently broad modification of their import duty schedules to warrant the term "revision" were Australia and possibly Canada, although quite a number of these areas made changes in duties on selected classes of commodities, and several of the smaller colonies resorted to the addition of uniform customs surtaxes, apparently as a means of effecting an increase in revenue. While the majority of the changes have been upward, material reductions in duties appear among the changes made in several of the Dominions and a number of British colonial areas.

Preferential Tariff Movement.—In

general, the tide of tariff preference keeps advancing in the British Empire. This year, for the first time, preferential duties for the products of Great Britain were introduced in British Borneo, and a Canada-Newfoundland agreement was concluded, exchanging tariff concessions. In quite a number of additional British areas existing preferential duties were extended in scope or amount. In fact, the tariff revisions consummated during the past year in Canada, Australia, and Mauritius were marked largely by increasing margins of preference for the products of Great Britain and certain other British areas, thus correspondingly increasing the handicaps on importations of products from other countries. On the other hand, in a treaty concluded with Germany, the Union of South Africa undertook that any future concessions to the products of British areas will be automatically extended to similar German products.

Trade Restrictions.—In the matter of restrictions, the most notable event in British areas during the past year was the abolition of the restriction on the exports of crude rubber from Malaya and Ceylon, following reductions in the export duties effected earlier in the year. As one of the most important efforts in recent times to control the supply of an important raw material for which the particular areas were the source of a majority of the supplies, its eventual abandonment after six years of experience, and the reasons prompting that action, are of particular significance in the field of commercial policy. Another type of restriction introduced or discussed in England and several of the British areas during 1928, has been the requirement that a given quota of the motion picture films which may be licensed for exhibition in the country must be of British origin, with that term strictly defined.

THE ORIENT

Chinese Autonomous Tariff.—The developments in the Chinese tariff situation during 1928 were undoubtedly among the outstanding events of the year in the field of trade control. Following the military unification of the country under the control of the Nationalist or Nanking authorities, notice was given to various Powers of the denunciation of the old so-called "unequal treaties" which, among other things, had for years limited the height of the Chinese tariff, with an invitation for the negotiation of new treaties on the basis of equality. The United States was the first country definitely to recognize Chinese autonomy in tariff matters, and to negotiate a treaty on that basis (July, 1928), asking for American trade no more than assurance of equal treatment in China with that accorded the commerce or citizens of any third country. By the end of the year, a number of additional countries had taken definite steps toward the similar recognition of Chinese tariff autonomy, and in early December, 1928, the Nanking Government announced the first autonomous tariff for China, to be brought into operation for one year from February 1, 1929. The proposed new schedule replaces the former uniform treaty rate of 5 per cent, which had been increased by various surtaxes in the different provinces, by a highly differentiated schedule with the rates of duty ranging from 5 per cent to 27½ per cent.

Persian Autonomous Tariff.—The new tariff schedule put into operation during 1928 by Persia, another of the Oriental countries recently to have attained autonomy in tariff matters, carries important upward and downward changes in duties, according to the relation of the various classes of goods to the economic interests of the country. Notable are the duty exemptions for motor vehicles, aircraft, telephone and telegraph instruments and typewriters. Industrial and agricultural machinery had already been admitted duty-free for several years, as part of the plan to encourage the modernization of the country. Following the denunciation of the old treaties which expired during 1927, about ten countries have thus far concluded new commercial arrangements with Persia, prac-

tically all of them—with the notable exception of the Russian Treaty—providing simply for an exchange of most-favored-nation treatment.

Japanese Domestic Preference.—Perhaps the only other noteworthy development in trade control in the Orient during the past year was the action of Japan in designating thirty-seven varieties of domestically produced manufactures which were to receive preference over foreign articles in government purchases, with the intimation that a considerable number of additional products are planned for addition to this list, including textile machinery, metals, chemical products and electrical appliances.

PUBLIC CONTROL OF FUTURES TRADING

By Arthur Richmond Marsh

Member, New York Cotton Exchange

ORGANIZED MARKETS

Expanding Trends.—The importance of organized futures markets as instrumentalities in the efficient and economical distribution of the great commodities of modern commerce has been evidenced in recent years by a distinct tendency to increase the number of commodities having such markets both in this country and abroad. Originally developed in connection with the marketing of cotton, grain and to some extent provisions (i. e., cured meats, lard, etc.), futures markets were later created for coffee, sugar, cotton-seed oil, cocoa and crude rubber.

During the past year a futures market for raw silk has been organized in New York City, providing facilities for futures trading in the greatest silk-consuming country in the world in addition to those already existing at Yokohama in Japan, the chief silk-producing country. Furthermore, it is generally understood that a futures market for certain of the metals, especially tin, will soon be in operation in New York City, supplementing the more informal futures market for tin, copper, antimony, etc., which has long existed in London. Finally, there has been much discussion in interested circles of late with reference to the desirability of establishing an American futures market for wool, and tentative suggestions have been made in various quarters that a futures market for jute and jute products (burlaps, cotton bagging, etc.) would be of material assistance to American importers, distributors and industrial users of these products.

All these movements clearly indicate that the commercial and financial community in the United States is more and more widely perceiving that continuous trading in future contract markets for that purpose greatly increases both the economy and the financial safety of the commercial distribution of commodities of world-wide use, whose production and consumption (and hence price) are constantly affected by forces beyond ordinary human control.

SCOPE OF REGULATION

General.—While commodity futures markets are thus increasing in number in the United States and seem likely to be established in the comparatively near future for all the principal commodities having a place in the country's commerce and industry, governmental regulation and control of such markets has as yet been seriously attempted only in the case of the cotton and grain markets; the abortive undertaking of certain officers of the Government soon after the war to employ the anti-trust laws as a means of regulating future trading in sugar having led to no permanent or systematic regulation of that market.

Cotton and Grain.—As regards the cotton futures markets, however, a moderate degree of governmental control is provided by the United States Cotton Futures Act, enacted by Congress in 1914; while somewhat more stringent and extensive governmental

regulation of the grain futures markets resulted from the United States Grain Futures Act, enacted by Congress in 1921. Both these laws have since been amended in matters of detail, though without substantial alteration of the main principles embodied therein. As would naturally be expected, there have also been modifications from time to time of the administrative methods employed by the Department of Agriculture in enforcing both laws. Here again it should be said, however, that such modifications of administrative practice have been comparatively unimportant, and that the guiding principle of the officials of the Department of Agriculture has in general been to interfere as little as possible with the free functioning of the cotton trade and the grain trade, respectively, within the bounds established by law. In other words, the attitude of the Government officials has very properly been that the experienced members of the two trades were better qualified than anybody else to bring operations in their respective futures markets into complete conformity with the terms of the law, and to devise remedies for incipient evils likely to result in violations of either the letter or the spirit of the law.

Government Attitude.—During the past year, Congress has neither enacted additional legislation nor amended existing law with reference to the cotton and grain futures markets. Similarly, the Department of Agriculture has introduced no innovation and has made no important change in detail in respect to its regulatory methods and practice for the two groups of futures markets. On the face of things, therefore, neither the cotton trade nor the grain trade has been compelled to adapt itself to new governmental requirements with regard to the nature of the future contracts permissible on the great exchanges or the rules governing transactions in such contracts. Consequently, there has been no interruption of the continuity of the dealings on the cotton and grain exchanges, and those markets have ostensibly functioned in virtually the same manner as in the preceding years since the enactment of the cotton and grain futures acts.

SENATE COTTON INQUIRY

Manipulation Charges.—While this is true, the past year has been marked by at least one important development in this field, the outcome of which may well be additional legislation by Congress in the near future. Early in 1928, it was brought to the attention of Congress that there were widespread complaints both in the cotton trade and industry proper and among the cotton producers that the cotton futures markets were being manipulated by powerful interests for their own profit in a manner highly detrimental not only to the general body of the cotton trade and industry but also to the producers who were suffering greatly from a contracting market and an uneconomically depressed price for their crop. By reason of these complaints the Senate instructed a subcommittee of its Committee on Agriculture and Forestry to make a thoroughgoing investigation of the entire matter, and to report its conclusions and recommendations in due course.

Committee Hearings.—In pursuance of these instructions the subcommittee held almost daily hearings through April and May this year, and heard the testimony of a large number of witnesses, including representative cotton merchants, members of the cotton exchanges, spokesmen of producers' associations, and officials of the Department of Agriculture concerned with the administration of the United States Cotton Futures Act. The scope of the investigation is perhaps indicated by the fact that the printed record of the hearings of the Senate subcommittee fills a volume of not far from fifteen hundred pages—a volume which must henceforth be regarded as an indispensable source of information not only for students of cotton marketing, but also for students of commodity futures markets in general.

Points in the Evidence.—Apart from matters of administrative de-

tail, the outstanding fact brought out by the testimony given before the Senate subcommittee is that, notwithstanding the supposedly controlling provisions of the United States Cotton Futures Act, the great cotton futures markets in this country, in conjunction with those in foreign countries consuming American cotton, have for some years past been subjected to extensive manipulations by powerful interests, through which prices in the several markets have been unduly enhanced or depressed to the advantage of the manipulators. The normal price relationships within and between the several futures markets, and between these markets and the domestic and foreign spot markets, have been uncommercially distorted and the normal functioning of the futures markets for the necessary "hedging" of cotton merchants and manufacturers as a body has been so effectually prevented that the purchase or sale of future contracts as "hedges," instead of affording reliable insurance against losses from changes in the price level, has for the trade at large become, in the main, a sure cause of such losses.

It appeared clearly from the evidence that the manipulators not only derived inordinate profits for themselves from the operations referred to, but actually derived a large part of these profits from their competitors through the contributions which the latter were compelled to make in the process of liquidating their "hedge" contracts. A further extremely harmful effect of the manipulative operations, as brought out by the evidence, was that large numbers of cotton merchants, finding themselves constantly incurring heavy losses on account of their "hedge" contracts in the futures markets, were compelled either to abandon their business altogether or to contract it greatly, with the result that the ability of the trade as a whole to carry cotton for distribution to the world's spinners was greatly reduced and the price received by the producers, during the active harvesting and marketing season, correspondingly suffered.

Manipulative Methods.—Among the methods shown to have been employed in the manipulative operations generally complained of, the following may be mentioned: (1) the purchase in a given futures market of so large a quantity of contracts for the delivery of cotton in a single month that the liquidation of these contracts by the actual delivery of the cotton is physically impossible; (2) the putting on of enormous "straddles," of an obviously uncommercial character, within a given futures market or between two markets—that is, buying inordinate quantities of contracts for one month in one market and at the same time selling corresponding quantities of contracts for delivery in a later month in the same market or in some month in the second market, not with the intention of receiving and delivering the cotton called for by the respective contracts, but rather of unduly enhancing the price of the contracts bought in relation to that of the contracts sold; (3) shipping large quantities of cotton at an obvious loss to a futures market in which it is sought to depress prices in relation to those in other markets; (4) continuously shipping deliverable cotton away from a futures market in which it is sought to enhance prices in relation to those in other markets, such shipments being made at an obvious loss.

Effect on Prices.—By such manipulative devices and others of a similar character, according to evidence before the Senate subcommittee, prices in the several futures markets for American cotton in this country and abroad were constantly forced into uncommercial and improper relationships, the normal price parities upon which the trade in general is compelled to rely in its "hedging" operations being destroyed, and the entire process of distributing American cotton under the long established system of "hedging" thrown into confusion.

COTTON FUTURES ACT

Bill to Amend.—As a result of the Senate subcommittee's findings of fact and conclusions therefrom, a

bill amending the United States Cotton Futures Act in a manner to prevent such abuses of the cotton futures markets henceforth was submitted to both the Senate and the House of Representatives with the favorable recommendation of the Committee on Agriculture of each legislative body. Before action could be taken on the bill, Congress adjourned for the Summer, but it was generally expected that the bill (or one similar to it) would be enacted into law during the session of Congress which began in December.

PROTECTION OF SECURITIES

By William R. Shands

Attorney-at-Law, Richmond

LEGISLATION

Enactments.—From the standpoint of securities legislation enacted in 1928 has produced no great results. During the preceding year sixteen states amended their laws regulating the sale of securities, the effect of several of the amendments being to rewrite the laws in question. It must not be supposed, however, that securities legislation has become so fixed as to withstand further changes; rather may the reason for so little legislative action in 1928 be found in the fact that this is not a legislative year.

Only two states appear to have amended their Securities Laws during the past year, these two being New York and Virginia. The New York law, better known as the "Martin Act," or the "Martin Blue Sky Act" (Article 23-A of the General Business Law), was amended to provide for the publication of required notices in the state paper to be published by the Department of State. The essential features of the act remain as before.

THE VIRGINIA STATUTE

Speculative Securities.—In Virginia the changes were much greater, the entire Securities Law being rewritten. The Virginia law, prior to the amendment, instead of embracing all securities, covered only those defined in the act as "speculative securities." In the present act use of the rather misleading term "speculative" has been avoided, though the former practice of enumerating the specific securities coming within the provisions of the law is still adhered to. Several classes of securities, about which formerly there was considerable doubt as to the application of the law, are now specifically covered. Among these are construction bond issues, investment trusts, declarations of trust, and securities of uniform small loan and industrial loan associations.

Administrative Certificates.—From the standpoint of the public, one great objection to the old law has this time been overcome. Prior to the amendment one seeking to determine whether the provisions of the law applied to a particular issue of securities, where any doubt was present, was unable to obtain any authoritative ruling from the state except through a test case. The present act provides for the issuance by the State Corporation Commission, the administrative body, of certificates of the non-applicability of the law in cases where the law does not cover the securities or the securities are specifically exempt.

Qualifications.—Since the Virginia law has in the past covered that class of securities consisting largely of actually speculative issues, no provision has heretofore existed for any rapid qualification of an issue, such as is found in the "qualification by notification" features in many of the more recent acts. This feature is not missing from the new Virginia law, but the manner in which it is set up and applied is at least novel in Virginia and probably in securities legis-

lation in this country. Briefly this matter is covered by writing into the act an exception covering securities. With few exceptions it is otherwise subject to qualification under the act, when offered for sale, sold, or advertised for sale only at the place or places of business of regularly established dealers in securities duly licensed under the act, or through the regularly retained and employed salesmen or solicitors of such dealers outside the regular place or places of business of such licensed dealer.

In order for a dealer to be licensed so that he may take advantage of the exception, he must have been engaged in business as a dealer in securities in Virginia and have had a regular place of business therein for one year, at least, prior to his application. In addition the Commission must be satisfied as to his good character, standing, reputation, integrity and financial responsibility, or, if the dealer is not an individual, of those composing the organization of the dealer. To grant a salesman's or solicitor's license the Commission must be furnished with satisfactory evidence of the individual's good character.

Once licensed the dealer thereafter qualifies the issues by notification, it being possible to give the necessary preliminary notice by telegram and within two days thereafter to complete the notification. The right to sell under this exception is subject to the proviso that if the selling commission be over 7½% or if the total overhead be over 15% such fact must be fully disclosed to the public. If the total overhead is in excess of 20% the exception does not apply.

Cause and Desist Orders.—Very important from the standpoint of the investing public and legitimate business is the right now given the Commission to issue, upon five days' notice, cease and desist orders whenever it appears that securities are being sold in violation of the act or a fraud is being perpetrated or attempted in connection with the disposition of any securities issue. This injunction feature, common to the laws of many of the other states, is new in Virginia.

PROPOSED LEGISLATION

District of Columbia.—In Congress two pieces of securities legislation were proposed, neither of which was enacted. Both of these bills (S. 3901 and H. R. 12731) had for their purpose the suppression of fraud in the sale of securities in the District of Columbia, which at present has no law regulating the sale of securities therein. The bills were similar, the object for introducing one in the House of Representatives and the other in the Senate being to achieve the possible enactment of the measure more quickly. The proposed legislation provided for the registration of dealers and salesmen, and required the filing of notice to sell before offering or selling securities in the District of Columbia.

California.—Indications point to many changes in securities legislation during the coming year. In California more than a year ago the State Bar Association appointed a special committee to study the Corporate Securities Act of that state. Since that time the State Bar, established in California by legislation, has taken over the functions of the former Bar Association, and among other things has continued the Blue Sky Committee to study all phases of the act. The Commissioner of Corporations is assisting the committee and is advocating certain changes in the law relating to injunctive relief, rulings by the department as to what constitutes securities, and criminal prosecutions. The committee is expected to report to the Board of Governors of the State Bar in December, 1928.

In Idaho there has been at work recently a Blue Sky Commission, appointed by the Governor to study securities legislation in that state for the purpose of determining the kind of law needed to provide adequate protection for investors and to encourage development of natural resources. The report of this committee is awaited with interest.

Kansas.—The securities official of Kansas reports that he has prepared

and has ready to present to the next session of his legislature a proposed law drafted along the lines of the act prepared by the Committee of the American Bar Association. The act referred to is, no doubt, the proposed Uniform Securities Law.

Other States.—In Oregon another committee appointed by the Governor is at work drafting amendments to be presented to the next legislature. New legislation will also probably be asked for in Rhode Island in 1929. Dissatisfaction on the part of certain officials with the Securities Law of Utah indicates that changes will be sought. As to what these changes will be is of interest, since this act is framed along the lines of what is known as Investment Bankers' Association Bill No. 2, adopted as to principal features in several of the other states.

Denison Bill.—For several years there was before Congress the Denison Bill designed to cover the use of interstate agencies in the sale and distribution of securities. Though the bill met with considerable favor in some quarters, it was not sufficient to overcome objections to it. Perhaps activities in its behalf have shown the need for accurate information as to present conditions and needs. Whether this prompted the investigation of the Federal Trade Commission along this line we do not know, but the investigation by that body should prove both instructive and interesting to state and Federal authorities.

UNIFORM SECURITIES LAW

Securities Sales.—The National Conference of Commissioners on Uniform State Laws have succeeded in perfecting many splendid pieces of uniform legislation. Several years ago this body turned its attention to the problem of regulating the sale of securities. Since then its Committee on a Uniform Sale of Securities Act has been trying to draft a uniform law on the subject. In August of last year the Committee submitted its third tentative draft, which is as yet unchanged. This proposed piece of legislation is framed on the same general principles as the Investment Bankers Association Bill No. 2 and meets with the approval of the Investment Bankers Association of America. To date, however, it has not been approved by the National Association of Securities Commissioners, which yet has the matter under consideration. It is earnestly hoped that some good will come from the efforts of the National Conference of Commissioners on Uniform State Laws to make more uniform if not uniform the laws of the several states regulating the sale of securities.

Results.—The state authorities report only a few decisions of importance recently involving their Securities Laws. This seems to indicate that they are becoming more fixed in their positions among the other laws in operation. No state with a Securities Law has yet seen fit again to do without it, though frequent changes therein are being made. Present developments show very clearly that those states yet contemplating changes are making careful studies of the conditions that the requirements and needs thereof may be met as fully as possible. It is a healthy sign to note the care being given the question; securities dealers and the investing public will thus have secured unto them the full protection to which they are entitled.

It takes more than mere legislation, however, to eliminate securities frauds; the general public must assist by its own attitude and efforts. The stock exchanges, the newspapers, securities dealers, and legitimate business, through its associations and in general, are realizing more than ever before this responsibility and are accepting their burdens in the fight. An endless fight it may be; but as long as the results accomplished far outweigh the burdens, whether accepted or imposed, of legitimate business, the fight must go on.

NATIONAL AND STATE BANKS

By Gurden Edwards
American Bankers Association

BANKS AND RESOURCES

Classification.—There were 26,213 banks of all classifications in the United States on June 30, 1928, with aggregate resources of $71,574,000,000. This was a decrease of 848 banks as compared with the number on the corresponding date in 1927, but an increase of $3,442,000,000 in point of resources. Total capital, surplus and undivided profits, on the given date amounted to $8,897,000,000, an increase in a year of $625,000,000, and deposits were $58,413,000,000, an advance of $1,677,000,000. The reports of banks by classes show there were 7,691 national banks, a drop in the year of 105 in this class; 15,078 state chartered commercial banks, a drop of 612; 1,633 trust companies, a drop of 14; 791 stock savings banks, a drop of 52; 616 mutual savings banks, a drop of 2; and 404 private banks, a drop of 63.

Banking Developments. — Consolidation of banks into larger units both in city and country districts continued to be the major development in banking during 1928 as in 1927. This movement has resulted in giving the nation larger and stronger banking institutions on the average. Another noteworthy development was the continued extension among commercial banks of savings and trust departments, a movement tending to wipe out sharp lines dividing banks into functional classes of commercial, savings and fiduciary institutions.

Consolidation Trend.—Treating in

RESOURCES AND LIABILITIES OF NATIONAL BANKS
(June 30, 1928 compared with June 30, 1927)
(in thousands of dollars)

	June 30, 1928—7,691 Banks	June 30, 1927—7,796 Banks
Resources		
Loans and discounts, including rediscounts	$15,144,995	$13,955,696
Overdrafts	10,138	9,788
Investments, including premiums on bonds	7,147,448	6,393,218
Banking house, furniture, and fixtures	721,229	680,218
Other real estate owned	125,680	115,817
Due from banks	1,885,967	1,967,950
Lawful reserve with Federal reserve banks	1,453,383	1,406,052
Checks and other cash items	207,156	191,054
Exchanges for clearinghouse	756,176	947,946
Cash on hand	315,113	364,204
Other resources	740,954	550,000
Total resources	$28,508,239	$26,581,943
Liabilities		
Capital stock paid in	$ 1,593,856	$ 1,474,173
Surplus	1,419,695	1,256,945
Undivided profits, less expenses and taxes paid	557,437	508,421
Reserved for taxes, interest, etc., accrued	83,753	70,326
National bank circulation	649,095	650,946
Due to banks	2,738,017	2,856,937
Certified checks and cashiers' checks outstanding	386,567	538,990
Dividend checks outstanding	28,404	.....
Individual deposits, including postal savings	19,300,433	18,239,353
United States deposits	185,916	139,843
Total deposits	22,639,337	21,775,123
Notes and bills rediscounted	179,077	120,024
Bills payable, including all obligations representing money borrowed other than rediscounts	622,108	248,018
Other liabilities	763,881	477,967
Total liabilities	$28,508,239	$26,581,943

detail the commercial banks of the country operating under state or Federal charter,—the national banking system showed strongly the movement toward fewer and larger banks. Between June 30, 1927 and June 30, 1928, while the number of national banks shrank from 7,796 to 7,691,—a loss of 105 units attributable to consolidations, absorptions, failures and conversions to state bank charters,—the system gained $1,926,300,000 in the aggregate assets of its members. In June, 1927, total national bank assets amounted to $26,582,000,000, while in June, 1928, they were $28,508,000,000. Thus, while the theoretical average national bank of 1927 had resources of $3,400,000, a similar average for 1928 would be $3,700,000. In other words, the national banks on the average increased in size by nearly 9 per cent. The table on page 341 shows the detailed changes which occurred in national banking in the year June 30, 1927 to June 30, 1928.

Savings Deposits.—Data compiled by the Savings Bank Division, American Bankers Association, revealed the great increase in savings in the United States and the enlarged participation in savings banking on the part of banking institutions other than stock and mutual savings banks. It showed total savings deposits in banks of all kinds on June 30, 1928 were $28,413,000,000, an increase in a year of $2,327,000,000. Of the total, only $10,234,000,000 were in stock and mutual savings banks, while more than $18,000,000,000 or over 64 per cent were in the commercial and fiduciary banking institutions.

Gold Reserves.—A conspicuous feature of banking operations as a whole in 1928 was the reversal of the international gold flow resulting in reducing the nation's reserves by nearly $500,000,000 as of June as compared with that date a year previous. Contraction of gold reserves and expansion of credit resulted in rising money rates, but these were most conspicuous in connection with speculative loans, while bank interest rates for commercial and productive business needs were loyally kept reasonable by the banks.

These data show an expansion of $1,189,299,000 in loans and discounts and in investments of $754,230,000. Deposits grew by $864,214,000. Capital paid in increased by $119,683,000, surplus by $162,750,000 and undivided profits by $49,016,000. Thus capital funds of the national banks expanded $331,449,000.

NATIONAL BANK DEVELOPMENT

Trust Powers.—It was announced that 2,373 national banks, or 31 per cent of the total number, were authorized to exercise trust powers in 1928, and were administering 63,776 trusts with assets of $3,297,300,000. National banks were obtaining the right to exercise trust powers at the rate of over 200 during a year.

Savings deposits in national banks on June 30, 1928, were $7,292,000,000, an increase in a year of $1,416,000,000; 4,489 of these banks had separate savings departments and their savings depositors numbered 16,188,541, a reported growth of 1,847,654 in this class of depositor in the year.

Banking Growth.—In the year, 103 new national bank charters were granted, 52 national bank associations were consolidated into 25, there were 156 voluntary liquidations and there were only 54 actual failures as compared with 135 the previous year, indicating a general subsidence of the great bank failure movement going on in the United States in recent years.

Charter Provisions.—The national banks during 1928 showed beneficial effects resulting from recent laws modernizing the Federal statutes aiming to place them on a competitive level with state commercial banks, but it was indicated by the Federal banking authorities that the continued conversion of national banks to state charter indicated further action was needed. The conversion of national banks into state banks was on account of more liberal charter provisions enjoyed by the latter. It was reported that under the provisions of the McFadden bill, which defined and limited branch banking in the Federal Reserve System, 103 new city branches of national banks as

allowed by the law were established, these bringing, with some conversions of state branch banks into national banks, the total number of branches in operation in the national bank system up to 992 on October 31, 1928. The National Bank Division, American Bankers Association, the chief national voluntary organization of the national banks, was active in protecting the circulation rights of these banks during the year, their taxation interests and other matters.

STATE BANKS

Changes.—State chartered commercial banks, unlike the national commercial banks, not only grew less in number but also in aggregate resources during the year under consideration. Between June 30, 1927 and June 30, 1928, the number of state commercial banks shrank from 15,690 to 15,078. This loss of 612 members was attributable to consolidations, conversions into national banks, voluntary liquidations and failures. The aggregate assets in this class of banks fell in the year from $16,565,000,000 to $16,291,000,000, a loss of $274,000,000.

The following figures show the detailed changes which occurred in the state commercial banks in the year June 30, 1927 to June 30, 1928:

RESOURCES AND LIABILITIES OF STATE (COMMERCIAL) BANKS

(June, 30, 1928 compared with June 30, 1927)

(in thousands of dollars)

	June 30, 1928—15,078 Banks	June 30, 1927—15,690 Banks
Resources		
Loans and discounts, including rediscounts	$ 9,450,337	$ 9,534,915
Overdrafts	34,535	29,292
Investments, including premiums on bonds	3,542,177	3,391,212
Banking house, furniture, and fixtures	458,961	462,665
Other real estate owned	145,434	152,416
Due from banks	908,578	1,101,279
Lawful reserve with Federal reserve banks or other reserve agents	802,255	698,063
Checks and other cash items	111,812	282,338
Exchanges for clearinghouse	103,625	121,967
Cash on hand	367,270	413,739
Other resources	366,019	377,102
Total resources	$16,291,003	$16,564,988
Liabilities		
Capital stock paid in	$ 1,051,182	$ 1,078,087
Surplus	737,475	735,949
Undivided profits, less expenses and taxes paid	285,926	270,096
Due to banks	513,947	614,807
Certified checks and cashiers' checks outstanding	98,048	195,514
Dividend checks outstanding	11,892	.....
Individual deposits, including postal savings	12,725,135	12,936,590
United States deposits	7,855	5,085
Total deposits	13,356,877	13,751,996
Notes and bills rediscounted	72,328	53,360
Bills payable, including all obligations representing money borrowed other than rediscounts	327,037	214,535
Other liabilities	460,178	460,965
Total liabilities	$16,291,003	$16,564,988

These data show a contraction of $84,578,000 in loans and discounts while investments expanded by $150,965,000. Deposits in the state banks decreased by $395,119,000. Paid in capital of the state commercial banks decreased in the year by $26,905,000, but surplus increased by $1,526,000, and undivided profits by $15,830,000; therefore, there was a net loss in capital funds to the amount of $9,549,000.

Service Extension.—As in the case of the national banks, there was a wide growth of departmental savings and trust activities among the state commercial banks. Reported savings deposits in state banks stood on June 30, 1928, at $1,161,000,000. The growth also of trust departments among state commercial banks, as in the case of national banks, reflected the spreading popular demand for complete banking services from a bank, including the handling of business and personal checking deposits, savings funds, investments and post-mortem financial management.

AMERICAN BANKERS ASSOCIATION

Philadelphia Convention. — The American Bankers Association with a membership of over 20,000 national and state commercial banks, trust companies and savings banks, comprising over 90 per cent of the nation's banking power, held at Philadelphia in 1927 its fifty-fourth annual convention at which leading topics of discussion related to the causes and remedies of bank failures, means for further improving banking methods and personnel, the development of more scientific and professional elements in banking, improvement of public bank supervision, promotion of regional clearing house organizations and examination systems, and the defense of banks against discriminatory taxation.

Educational Foundation.—The Association, having completed its $500,000 Educational Foundation, established in 1925 to further banking and financial scholarships and research in colleges in commemoration of its Golden Anniversary, put it into operation during the year with the allotment of 167 loan scholarships in $250 units in colleges and universities throughout the country.

Election of Officers.—The general officers of the Association elected for 1927-28 are: President, Craig B. Hazlewood, Vice President, Union Trust Company, Chicago; First Vice President, John G. Lonsdale, President, National Bank of Commerce, St. Louis; Second Vice President, Rome C. Stephenson, Vice President, St. Joseph County Savings Bank, South Bend, Ind.; Treasurer, W. D. Longyear, Vice President, Security Trust and Savings Bank, Los Angeles; Executive Manager, F. N. Shepard, American Bankers Association, New York.

The State Bank Division of the American Bankers Association, the national organization of commercial state chartered banks, comprising a majority of banks of this class, was especially active during the year in promoting better banking practices and methods, the promotion of better state bank supervision conditions, the organization of city, county and regional clearing house associations to foster a greater degree of coöperation for the common good among locally competing banks, and in a number of other directions aiming at improved banking both for the banks and the public.

THE FEDERAL RESERVE SYSTEM

By E. A. Goldenweiser

Federal Reserve Board, Washington

LEGISLATION

Interlocking Directorates.—An act approved March 9 amended Section 9 of the Clayton Anti-trust Act so as to broaden the power of the Federal Reserve Board in granting permits for limited interlocking of bank directorates. The Board had been authorized to grant permits only in cases involving a member bank, where the banks of the interlocking directorates were not in substantial competition with one another. Under the amendment of March 9 permits may be granted in any case, without reference to substantial competition, if in the judgment of the Board the granting of the permit is not incom-

patible with the public interest, and even though no member bank is involved. This power is still limited as previously to the granting of permits for individual directors to serve not more than three banking institutions.

State Banks as Depositaries.—It was provided in an act of May 7 that state member banks might be designated as general depositaries of public money by the Secretary of the Treasury, and be employed as financial agents of the Government, the intention of the act being to place these banks on a parity with national banks in respect to the services indicated. Under different enactments, state banks had already been made eligible to receive deposits of postal savings funds, funds of insolvent national banks, Indian moneys under the jurisdiction of the Department of Interior, and proceeds from the sale of United States securities. Deposits in these accounts had run on the average between $400,000,000 and $500,000,000, whereas the deposits in which state banks had not been participating had averaged only about $25,000,000. So that, while the act of May 7 formally increased the number of potential general depositaries, it did not in effect materially extend the eligibility of state banks to receive public deposits.

Bills of Exchange.—By an act of May 29, the authority of the reserve banks to discount or purchase sight or demand bills of exchange, which had been restricted to such bills drawn to finance the domestic shipment of non-perishable, readily marketable staple agricultural products, was broadened to cover such bills growing out of the exportation as well as the domestic shipment of non-agricultural as well as agricultural staples.

Hearings on Speculative Loans.—In February and March hearings were held by the Senate Committee on Banking and Currency on a resolution introduced in the Senate favoring immediate action by the Federal Reserve Board to restrict the further expansion of loans by member banks for speculative purposes. In a modified form the resolution was favorably reported back to the Senate, but no action was taken by the Senate on the committee's recommendation.

FEDERAL RESERVE POWERS

Stabilization.—Early in March a bill was introduced in the House proposing to amend the Federal Reserve Act so as to define policies toward which the powers of the Federal reserve system should be directed and authorize investigations and studies to be made by the Federal Reserve Board and the reserve banks under a comprehensive research program outlined in the bill. The bill proposed to direct the Federal reserve system to "use all the powers and authority now or hereafter possessed by it to maintain a stable gold standard; to promote the stability of commerce, industry, agriculture, and employment, and a more stable purchasing power of the dollar, so far as such purposes may be accomplished by monetary and credit policy."

Committee Hearings.—In the hearings before the House Committee in May consideration in detail of the purposes designated in the bill as purposes toward which the policies of the system should be directed gave rise to discussions taking a wide range in the theory of prices and credit, as well as in review of the experience and credit policies of the Federal reserve system in recent years. Although more elaborate in its provisions, the bill was essentially similar in its purpose to a bill introduced in 1926 on which prolonged hearings were held before the Banking and Currency Committee. No report on the bill was made by the committee.

Question of Price Control.—In general, representatives of the Federal reserve system who appeared as witnesses before the committee took the position that the relationship between prices and credit was not direct and not uniform at all times and that legislative direction for price stabilization would not increase the system's powers and might, on the other hand, embarrass it by creating the impression that the system can and should control prices.

CREDIT POLICIES

Keeping Money Firm.—Owing to the rapid growth of bank credit in the early part of 1928, in the absence of any proportionate increase in the demand for credit accommodation originating in the requirements of trade and industry, Federal reserve policy during the year was directed toward the development of greater firmness in the money market. This policy was expressed through sales of United States securities by the reserve banks and through advances in discount and open-market rates.

Discount rates, which had been reduced from 4 to 3½ per cent in the late summer of 1927, were advanced to 4 per cent at all of the reserve banks in the period from January 25 to March 1, to 4½ per cent at all of these banks in the period from April 20 to June 7, and to 5 per cent at all but four of the reserve banks in the period from July 13 to August 1. The reduction in holdings of Government securities by the reserve banks during the year amounted nearly to $400,000,000.

MONEY MARKET CONDITIONS

Member Bank Indebtedness. — Sales of securities by the reserve banks resulted in a considerable increase of indebtedness of member banks to the reserve banks. In addition, there were during the year exports of gold, which reduced the country's monetary gold stock to a level about $500,000,000 below the peak reached in May, 1927. The resulting growth of member bank indebtedness, which carried the total above $1,000,000,000 in June, was reflected in a rise of money rates.

Loan Rates.—Rates on call loans in October averaged 6.98 per cent, compared with 3.9 a year earlier; rates on commercial paper in the open market 5½ per cent, compared with 4 per cent in the autumn of 1927, and rates on bankers' acceptances 4½ per cent as compared with 3⅛ to 3¼ per cent last year. The rise in rates, it will be noted, was much greater for loans on securities than for commercial loans, and advances in rates charged by banks to their commercial customers were smaller than advances in open-market rates. After the middle of September gold imports in moderate volume and sales of acceptances to the reserve banks by the market in larger amounts than in other recent years resulted in a decline of member bank indebtedness and in some easing of interest rates in the money market. The rates, however, still remained at a higher level than at any time in the last seven years.

RESERVE BANK CREDIT

Member Banks.—The tightening of conditions in the money market had the effect of arresting the growth of member bank credit which had been very rapid early in the year. The peak of bank credit expansion was reached in midsummer and after that time the volume of bank credit, though showing considerable fluctuations, had a distinct downward trend. The decline in bank credit was in investment holdings of the banks and in their loans on securities, while loans for commercial purposes continued to increase. There was a large growth of American acceptances, which in the autumn of the year were in larger volume than at the same season of any previous year. The seasonal requirements for credit and currency to finance the autumn expansion of trade and the marketing of crops were freely met by the banks, though at a cost to borrowers somewhat higher than in 1927. There was no evidence, however, that higher money rates had any adverse effects on general business conditions and the volume of industrial and trade activity was at a high level throughout the year.

Assets and Liabilities.—In the accompanying table are shown changes over the year ended November 9 in the principal assets and liabilities of about 630 member banks in leading cities which report weekly to the Federal Reserve Board and have about 60 per cent of the total loans and investments of all banks belonging to the Federal reserve system. Approximately half of the increase

of $1,175,000,000 in total loans and investments of these banks was in loans on securities, the increase for this class of loans amounting to $579,000,000. For all other loans and discounts, including those made principally for commercial purposes, the increase amounted to $356,000,000, and for holdings of investments to $240,000,000. Some increase in the proportion of time to total deposits is indicated, the increase for the total of net demand and time deposits combined amounting to $226,000,000. Borrowings at the reserve banks were in larger volume in November of this year by the amount of $424,000,000.

PRINCIPAL ASSETS AND LIABILITIES OF REPORTING MEMBER BANKS

(In millions of dollars)

	November 9, 1927	November 7, 1928	Change
Loans and investments: total	21,299	22,474	+ 1,175
Loans on securities	6,340	6,919	+ 579
All other loans and discounts	8,823	9,179	+ 356
Investments	6,136	6,376	+ 240
Net demand deposits	13,577	13,345	— 232
Time deposits	6,463	6,921	+ 458
Borrowings from Federal Reserve Banks	310	735	+ 424

The accompanying table, for corresponding dates in November of 1927 and 1928, brings out the more significant changes over the year, especially the decrease of gold reserves, and in the reserve ratio of the Federal reserve system, and the increase in the total volume of reserve bank credit outstanding. The composition of reserve bank assets was materially modified by the increase noted above in member bank borrowings at the reserve banks and in holdings of acceptances, and by the decrease in holdings of United States securities.

PRINCIPAL RESOURCES AND LIABILITIES OF THE TWELVE FEDERAL RESERVE BANKS COMBINED

(In millions of dollars)

	Nov. 9, 1927	Nov. 7, 1928	Change
Resources			
Total gold reserves	2,910	2,643	— 267
Bills discounted	461	957	+ 497
Bills bought in open market	336	449	+ 112
U. S. Government securities	530	223	— 308
Total bills and securities	1,328	1,632	+ 304
Liabilities			
Federal reserve notes in actual circulation	1,735	1,742	+ 8
Deposits:			
Member bank—reserve account	2,369	2,330	— 39
Government	22	25	+ 3
Foreign bank	7	7	....
Other deposits	25	24	— 2
Total deposits	2,423	2,385	— 39
Capital paid in	131	146	+ 15
Surplus	229	233	+ 5
Ratio of total reserves to deposit and Federal reserve note liabilities combined	73.1 per cent	67.1 per cent	

BROKERS' LOANS

Included in the volume of member bank credit are the loans made by New York City banks to brokers and dealers in securities for which figures are given below in some detail. On examination of these figures it will appear to what extent the growth in these loans during 1928 was in loans made for account of "others," which include loans made by these banks for account of individuals, corporations, and other investing agencies, domestic and foreign. For these accounts the increase over the year exceeded $1,200,000,000. Loans to brokers and dealers made by New York City banks for their own account were outstanding in somewhat smaller volume on November 7 of 1928 than on the corresponding date of 1927, loans for account of out-of-town banks increasing by nearly the amount of $450,000,000.

BROKERAGE LOANS

(In millions of dollars)

	Nov. 9, 1927	Nov. 7, 1928	Change
For own account	1,125	1,064	— 61
For account of out-of-town banks	1,277	1,726	+ 449
For account of others	982	2,188	+ 1206
Total	3,385	4,979	+ 1594
On demand	2,577	4,368	+ 1791
On time	808	611	— 197

GOLD MOVEMENTS

Changes in our monetary gold stock, which were an important factor in the credit situation during the year, are shown by months for a series of years in the table following. In the fourteen months from the end of April, 1927, to the end of June, 1928, our monetary gold stock was reduced by $500,000,000. In June, 1928, however, the outward movement of gold came to an end, partly as the result of the higher money rates prevailing in this country. Between the end of June and the end of November there was an increase of about $35,000,000 in our gold stock and further increases were reported in November. The exports of gold from the United States in 1927 and 1928 had an important bearing upon monetary reconstruction in Europe.

MONETARY GOLD STOCK OF THE UNITED STATES

(In millions of dollars)

	1923	1924	1925	1926	1927	1928
End of month:						
January	3,953	4,289	4,423	4,412	4,564	4,373
February	3,963	4,323	4,369	4,423	4,586	4,362
March	3,970	4,364	4,346	4,442	4,597	4,305
April	3,982	4,411	4,350	4,438	4,610	4,266
May	4,028	4,455	4,361	4,433	4,608	4,160
June	4,050	4,488	4,365	4,447	4,587	4,109
July	4,079	4,511	4,370	4,471	4,580	4,113
August	4,111	4,521	4,383	4,473	4,588	4,123
September	4,136	4,511	4,382	4,466	4,571	4,123
October	4,167	4,509	4,407	4,473	4,541	4,144
November	4,207	4,527	4,397	4,477	4,451	....
December	4,244	4,499	4,399	4,492	4,379	....

THE GOLD STANDARD

Progress.—Reëstablishment of the gold standard in France on June 25 signalized the practical completion of the world's monetary reconstruction, which has been in process since 1923, and has brought the currencies of the more important commercial countries into definite relationship to gold, with gold parities fixed by law.

This progressive rehabilitation of monetary systems upon a gold basis has been accompanied by withdrawal of gold in considerable volume from the United States, by gradual accumulation of central gold reserves in different countries, and in general by a redistribution of the world's stock of monetary gold.

Changes in the central gold holding of principal countries during this period of monetary reconstruction are shown in the following table:

CENTRAL GOLD HOLDINGS

(End of June figures. In millions of dollars)

Country	1924	1925	1926	1927	1928	Increase (+) or decrease (—) between 1924 and 1928
United States [1]	4,095	3,962	4,056	4,202	3,732	— 363
France	710	711	711	875 [2]	1,136	+ 426
Great Britain	624	765	731	740	838	+ 214
Argentina	458	461	451	452	616	+ 158
Japan	599	586	570	544	542	— 57
Spain	489	490	490	501	503	+ 14
Germany	110	253	355	429	496	+ 386
Italy	218	219	219	225	257	+ 39
Netherlands	214	183	172	162	175	— 39
Other countries	1,146	1,226	1,226	1,287	1,437	+ 292
Total	8,663	8,856	8,981	9,417	9,733	+1,070

[1] Treasury and Federal Reserve Banks.
[2] Partly estimated.

Changes in Gold Stocks.—The increase for the period of more than $1,000,000,000 in these gold reserves represents excess of gold production over consumption by the arts and absorption by India, acquisition of gold from private hoards, and release for monetary use of gold previously held as security for loans. Increase in holdings is shown for all countries listed, with exception of the United States, Japan, and Netherlands. In these other countries taken as a whole, central gold holdings increased by more than $1,500,000,000, the increase representing in part withdrawal of gold from the three countries mentioned. The withdrawal of gold from the United States, which is the only country showing a considerable decrease over the period, reduced the proportion of the world's central gold holdings held in this country from 50 per cent in 1924 to 40 per cent in the midsummer of 1928. This withdrawal was not, however, in sufficient volume materially to affect the exceptionally strong reserve position of the reserve banks. During the year the reserve ratios of central banks in all of the countries in the table, with exception of the United States and Japan, have advanced and this increase in the gold holdings has contributed to the security of the international gold standard.

CHANGES IN BANK MEMBERSHIP

Banks.—During the year ending June 30, 1928, 145 banks joined the Federal reserve system and 118 withdrew from membership, including banks that withdrew as a result of absorption of member by nonmember banks. Mergers between member banks, suspensions and liquidations resulted in the loss of 197 member banks, so that total membership in the system showed a net decline of 170 for the year. On June 30, 1928, there were 8,929 member banks—about one-third of the banks in the country—with resources equal to about two-thirds of the country's total banking resources. While the number of member banks has declined somewhat in recent years, the resources of these banks have grown steadily and have continued to constitute nearly two-thirds of the resources of all banks in the country.

Personnel.—The principal changes in personnel of the Federal reserve system during the year were as follows: M. B. Wellborn resigned as Governor of the Federal Reserve Bank of Atlanta, effective December 31, 1927, and Eugene R. Black was appointed to succeed him; Governor Benjamin Strong of the Federal Reserve Bank of New York died on October 16. Gates McGarrah, Chairman of the Board and Federal Reserve Agent, was designated acting governor.

The following changes occurred in the membership of the Federal Advisory Council:

Walter W. Smith was appointed to represent the St. Louis district to succeed Breckinridge Jones, and F. L. Limpan was appointed as the representative of the San Francisco district to succeed to the position of Henry S. McKee.

OTHER BANKS AND TRUST COMPANIES

By Gurden Edwards

American Bankers Association

SAVINGS BANKS

Stock Institutions.—There were 1407 banking institutions in the United States in 1928 reported as savings banks and 1633 trust companies. Of these savings institutions 791 were stock savings banks with total resources of $1,707,000,000 and with capital, surplus and undivided profits of $128,449,000 on June 30, 1928.

RESOURCES AND LIABILITIES OF STOCK SAVINGS BANKS

(June, 30, 1928, compared with June 30, 1927)

(in thousands of dollars)

	June 30, 1928—791 Banks	June 30, 1927—843 Banks
Resources		
Loans and discounts, including rediscounts	$1,049,969	$1,144,709
Overdrafts	207	263
Investments, including premiums on bonds	427,987	419,803
Banking house, furniture and fixtures	45,791	45,857
Other real estate owned	23,335	24,326
Due from banks	87,864	130,824
Lawful reserve with Federal reserve banks or other reserve agents	27,917	7,408
Checks and other cash items	16,809	13,067
Exchanges for clearinghouse	3,340	3,167
Cash on hand	19,912	23,692
Other resources	4,066	2,422
Total resources	$1,707,197	$1,815,538
Liabilities		
Capital stock paid in	$ 68,878	$ 69,144
Surplus	42,472	46,554
Undivided profits, less expenses and taxes paid	17,099	16,030
Due to banks	10,995	11,334
Certified checks and cashiers' checks outstanding	398	451
Dividend checks outstanding	63	.....
Individual deposits, including postal savings	1,561,218	1,661,803
United States deposits	343	562
Total deposits	1,573,017	1,674,150
Notes and bills rediscounted	850	1,401
Bills payable, including all obligations representing money borrowed other than rediscounts	2,291	2,270
Other liabilities	2,590	3,989
Total liabilities	$1,707,197	$1,815,538

These figures represent a loss in numbers of 52 for this class of bank, with a decrease of $108,341,000 in point of total resources and $5,279,000 in capital funds as compared with the corresponding date for 1927. These reductions are in line with the trend of recent years in this class of banking institution which is suffering from competition of other classes of banks now conducting savings activities and attracting deposits. The deposits declined in the stock savings banks in the year by $101,000,000. The figures in the table on the opposite page show the detailed changes which occurred in the stock savings banks in the year June 30, 1927, to June 30, 1928.

The mutual savings banks fared better during the year. There were 616 institutions reported as mutual savings banks on June 30, 1928, with aggregate resources of $9,688,000,000. These figures represented a loss as to numbers of only two banks in the year since June 30, 1927, and an increase in resources in the period of $677,000,000. The capital funds in this class of bank, comprised in the items surplus and undivided profits, also expanded, standing at $1,000,200,000 in June, 1928, as compared with $920,260,000 the year earlier, or an increase of $79,940,000. A substantial rise in deposits of this class of bank was also recorded, this item standing on the 1928 date at $8,673,200,000, a rise for the year of almost $600,000,000. The following figures show the detailed changes which occurred in mutual savings banks in the year June 30, 1927, to June 30, 1928:

RESOURCES AND LIABILITIES OF MUTUAL SAVINGS BANKS

(June, 30, 1928, compared with June 30, 1927)

(in thousands of dollars)

	June 30, 1928—616 Banks	June 30, 1927—618 Banks
Resources		
Loans and discounts, including rediscounts	$5,511,918	$5,064,595
Investments, including premiums on bonds	3,750,591	3,523,350
Banking house, furniture and fixtures	100,716	93,330
Other real estate owned	14,600	12,668
Due from banks	210,698	224,741
Checks and other cash items	1,517	1,094
Exchanges for clearinghouse	209	209
Cash on hand	31,162	31,212
Other resources	66,748	59,986
Total resources	$9,688,159	$9,011,185
Liabilities		
Surplus	$ 851,590	$ 782,927
Undivided profits, less expenses and taxes paid	148,586	137,332
Due to banks	204	108
Certified checks and cashiers' checks outstanding	25	44
Dividend checks outstanding	149	.....
Individual deposits, including postal savings	8,672,823	8,077,099
Total deposits	8,673,201	8,077,251
Bills payable, including all obligations representing money borrowed other than rediscounts	540	568
Other liabilities	14,242	13,107
Total liabilities	$9,688,159	$9,011,185

Savings Deposits.—While the foregoing figures cover the specifically designated savings banking institutions, savings banking activities, however, in the United States are not wholly comprised within such institutions. To find the full facts regarding savings deposits in banks it is necessary to go to the figures for all classes of banks as has been done by the Sav-

ings Bank Division of the American Bankers Association. This organization has estimated that over 85% of all banks in America, including commercial banks and trust companies, now operate savings departments. The figures compiled by the bankers association show that the total savings in banks in the United States on June 30, 1928, aggregated $28,413,000,000, an increase of $2,327,000,000 over the corresponding date of a year earlier and the greatest gain in these figures ever recorded. W. Espey Albig, the compiler of these figures, in commenting on them pointed out that only three states failed to show gains in savings and that the figures indicate a greater popular diffusion of prosperity than at any time since the business depression of 1920. The theoretical per capita gain in savings recorded in 1928 was $17 and the per capita savings was $237.

Savings Depositors.—Mr. Albig's figures also showed a notable increase in the number of savings depositors, the total number being reported at 53,188,348, a net gain over the comparable figures of the year previous of 2,496,070. This means that while the ratio gain in population was 1.2%, the ratio gain in number of savings account holders was 5.2%. The following tables give a statistical picture of the savings banking situation in the United States in 1928 as compared with the situation during the immediately preceding years.

SAVINGS DEPOSITS IN CLASSIFIED BANKS

(in thousands of dollars)

Year	Mutual Savings	State Banks	Trust Companies	Private Banks	National Banks
1923	$6,273,151	$6,456,649	$2,252,203	$58,194	$4,686,337
1924	6,693,247	6,789,872	2,501,244	46,365	5,158,006
1925	7,152,258	7,253,437	2,870,389	47,702	5,810,266
1926	7,525,189	7,674,880	3,270,494	47,899	6,177,730
1927	8,039,784	7,382,147	3,530,954	49,725	7,088,297
1928	8,668,090	7,597,977	4,080,324	16,797	8,049,773

TOTAL DEPOSITS AND DEPOSITORS IN ALL BANKS

Year	Total Savings Deposits	Total Number Savings Depositors	U. S. Per Capita Savings Deposits
1923	$19,726,534,000	35,878,758	$178
1924	21,188,734,000	38,741,634	185
1925	23,134,052,000	43,850,127	204
1926	24,696,192,000	46,762,240	211
1927	26,090,902,000	48,354,784	220
1928	28,412,961,000	53,188,348*	237

* Ohio state banks included for the first time.

SAVINGS DEPOSITORS IN CLASSIFIED BANKS IN 1927

Class of Bank	No. of Savings Depositors
Mutual savings	11,643,335
State banks	18,391,740
Trust companies	6,869,372
Private banks	102,472
National banks	16,181,429
Total	53,188,348

School Savings.—Another important phase of savings is school savings banking, developed under the leadership of the American Bankers Association's Savings Bank Division. It is the plan by which education in thrift is being carried on along with school hours on a wide scale throughout the country, with a vigorous tendency to spread further, as shown in the following figures:

SCHOOL SAVINGS IN THE UNITED STATES

Year	Number of Schools	Number Participating	Deposits	Net Savings
1923-24	9,080	2,236,326	$14,991,535	$8,556,991
1924-25	10,163	2,869,497	16,961,560	7,779,992
1925-26	11,371	3,403,746	20,469,960	8,770,731
1926-27	12,678	3,742,551	23,703,436	9,464,178
1927-28	13,835	3,980,237	26,005,138	9,476,391

Deposits are made by pupils in their classrooms on scheduled days. The funds are held in designated banks subject to control of the individual up to the amount of his credits.

TRUST COMPANIES

Number and Resources.—Trust companies in the United States continued to register during 1928 the notable growth which has characterized this type of financial institution during the last decade. Although during the year June, 1927, to June, 1928, the numbers of other classes of banks decreased in a rather marked degree, there being a drop of 848 banks of all types, the trust companies showed an almost negligible loss in numbers. On June 30, 1928, there were 1,633 trust companies in the United States, only 14 less than at the corresponding date of the year before, while they showed very marked increase in resources, which stood at $15,231,000,000, a growth of $1,236,000,000 as compared with the year before. The item of loans and discounts contributed an increase of $819,000,000 to this expansion of general assets and

RESOURCES AND LIABILITIES OF LOAN AND TRUST COMPANIES

(June 30, 1928 compared with June 30, 1927)

(in thousands of dollars)

	June 30, 1928—1,633 Banks	June 30, 1927—1,647 Banks
Resources		
Loans and discounts, including rediscounts	$ 8,298,341	$ 7,479,570
Overdrafts	5,138	3,690
Investments, including premiums on bonds	3,874,652	3,498,845
Banking house, furniture, and fixtures	333,652	294,212
Other real estate owned	88,056	85,985
Due from banks	510,014	520,555
Lawful reserve with Federal reserve banks or other reserve agents	819,697	818,225
Checks and other cash items	516,413	572,869
Exchanges for clearinghouse	35,174	46,845
Cash on hand	151,571	171,852
Other resources	598,188	502,108
Total resources	$15,230,896	$13,994,756
Liabilities		
Capital stock paid in	$ 803,328	$ 745,647
Surplus	1,085,968	932,337
Undivided profits, less expenses and taxes paid	215,538	195,617
Due to banks	816,443	805,334
Certified checks and cashiers' checks outstanding	322,422	384,632
Dividend checks outstanding	16,464	.....
Individual deposits, including postal savings	10,874,503	10,094,485
United States deposits	28,702	40,534
Total deposits	12,058,534	11,332,985
Notes and bills rediscounted	66,649	52,951
Bills payable, including all obligations representing money borrowed other than rediscounts	283,277	123,892
Other liabilities	717,602	611,327
Total liabilities	$15,230,896	$13,994,756

investments an increase of $376,000,000. All classes of capital funds of the trust companies also recorded notable increases; paid in capital aggregated $803,300,000, an increase of almost $57,700,000, surplus stood at $1,086,000,000, an advance of over $153,600,000, and undivided profits at $215,500,000, which marked an increase of about $19,900,000 in this item. Thus there was an aggregate increase of $231,000,000 in trust company capital funds. Total deposits in the trust companies stood at $12,058,500,000 June 30, 1928, an increase of $725,500,000 in a year. The figures on page 353 show the detailed changed which occurred in the trust companies in the year June 30, 1927 to June 30, 1928.

The trust company division, American Bankers Association, is the chief national unifying factor among the trust companies. This organization reached its thirty-second year of activity in 1928. When it was organized there were only 242 trust companies with resources of but $807,000,000 as compared with the present 1,633 companies with over $15,000,000,000. The division represents the trust companies in a national way in many capacities, such as in respect to both Federal and state legislation affecting their business and that of their clients and in regard to taxation bearing on banking resources, estates, trusteed funds and other property entrusted to their care.

PRIVATE BANKS

The private banks reporting to the public banking authorities in the United States during 1928 numbered 404 institutions, or a drop of 63 units in this class reporting during the year. The total resources also showed a decrease, amounting on June 30, 1928, to only $148,834,000, which was a shrinkage of $15,314,000 as compared with their figures for the corresponding date in 1927. Their total paid-in capital at $8,278,000 recorded a reduction of $1,169,000, their surplus at $8,329,000 was $1,486,000 less than the year previous and their undivided profits reported at $1,775,000 were $65,000 greater. Thus the private banks' total capital funds at $18,382,000, suffered a loss in a year of $2,590,000. The total deposits also were reduced, being $112,161,000 which was $12,192,000 below the figure for the year previous.

FEDERAL LAND BANKS

The resources of the twelve Federal Land Banks on September 30, 1928 stood at $1,264,000,000, which was an increase of $46,000,000 as compared with the figure of the year previous. The principal assets of these Associations consisting of mortgage loans aggregated $1,277,000,000, an expansion in the year of $134,000,000. Their combined capital, reserves and undivided profits were $80,600,000, an increase in the year of $5,000,000. The 50 joint stock land banks on the same date showed a decrease in number of 33 and, with aggregate resources of $659,841,000, an increase in assets in a year of $6,523,000. Their mortgage loans rose from about $610,000,000 to $643,000,000, a gain of $33,000,000. Paid-in capital stock increased to $41,607,000, a gain in this item in the year of $751,000. Total capital funds of these Associations was $52,300,000 as compared with $52,800,000 a year earlier. The twelve Federal Intermediate Credit banks on September 30, 1928, had aggregate resources of $109,478,000, a drop in a year of $815,000. Their loans were $17,741,000.

BANK FAILURES

Reports on failures of all classes of state and private banks for the year June 30, 1927, to June 30, 1928 showed that there was a total of 4 suspensions with aggregate liabilities of $125,784,000. These figures record a marked decrease over the preceding year, when there were 689 failures among these classes of banks with liabilities at $206,655,000. National banking also showed a betterment in this respect. In the year ending October 31, 1928, 61 national banks with aggregate capital of $4,135,000 were placed in charge of receivers. This compares with 135 banks with capitalization of $8,257,000 in trouble the preceding year.

COMPOSITE BANK DATA

Summarizing the composite data for all banks in the United States, the number on June 30, 1927, was 26,213 as compared with 27,061 a year earlier. The following table gives a general survey of the changes in their financial statistics during this period:

RESOURCES AND LIABILITIES OF ALL REPORTING BANKS IN THE UNITED STATES AND POSSESSIONS

(June, 30, 1928, compared with June 30, 1927)

(in thousands of dollars)

	June 30, 1928—26,213 Banks	June 30, 1927—27,061 Banks
Resources		
Loans and discounts, including rediscounts	$39,542,067	$37,270,378
Overdrafts	50,407	43,450
Investments, including premiums on bonds	18,771,814	17,255,093
Banking house, furniture, and fixtures	1,663,696	1,580,105
Other real estate owned	403,967	399,473
Due from banks	3,616,408	3,967,448
Lawful reserve with Federal reserve banks or other reserve agents	3,105,840	2,932,954
Checks and other cash items	854,531	1,060,990
Exchanges for clearinghouse	898,567	1,120,177
Cash on hand	887,845	1,007,896
Other resources	1,779,186	1,494,594
Total resources	$71,574,328	$68,132,558
Liabilities		
Capital stock paid in	$ 3,525,522	$ 3,376,498
Surplus	4,145,529	3,764,527
Undivided profits, less expenses and taxes paid	1,226,361	1,131,206
Reserved for taxes, interest, etc., accrued	83,753	70,326
National-bank circulation	649,095	650,946
Due to banks	4,081,028	4,289,337
Certified checks and cashiers' checks outstanding	807,580	1,119,943
Dividend checks outstanding	57,005	.....
Individual deposits, including postal savings	53,244,698	51,132,554
United States deposits	222,816	194,024
Total deposits	58,413,127	56,735,858
Notes and bills rediscounted	319,317	228,127
Bills payable, including all obligations representing money borrowed other than rediscounts	1,246,829	601,381
Other liabilities	1,964,795	1,573,689
Total liabilities	$71,574,328	$68,132,558

FOREIGN EXCHANGE

By Fred I. Kent

Director, Bankers Trust Company

PROGRESS OF STABILIZATION

General.—Following the armistice the foreign exchanges of the principal countries of the world outside of the United States passed through some very difficult periods during which the moneys of the countries were subjected to violent fluctuations. This had a retarding influence upon the foreign trade of the world. Since 1924 the currencies of the nations involved have been stabilized one by one until in June, 1928, the last of the great trading countries of the world returned to a gold basis when M. Poincaré, the Premier of France, announced the stabilization of the French franc. The Italian lira had been stabilized by Government decree Dec. 21, 1927, so that the effect of this action was really not felt until 1928.

The French franc by means of *de facto* stabilization had been held at approximately the price of the legal fixation for some time previous to M. Poincaré's announcement, but as business interests had no means of determining whether legal stabilization when undertaken would result in a changed value of the franc, they were obliged to carry on most conservatively. The final stabilization, therefore, of the French franc resulted in clearing the exchange atmosphere very materially in view of the large number of other countries whose action had preceded it.

High Money Rates in New York.—During the latter part of 1928 the high value of money in New York, due primarily to the rise in stock values, resulted in testing the effectiveness of the stabilization which had been undertaken in other countries of the world as New York offered a tremendous attraction for foreign funds. It is a source of very great satisfaction, therefore, to note that, even with such abnormally high rates for money as prevailed in New York for so many months, the exchanges of the world held their own extremely well, and there were no unfortunate upsets. While the high money in New York did change the gold trend, yet the amount imported proved to be unimportant to shipping nations and to the United States. In the case of Great Britain this was most unfortunate as Germany was calling upon London for gold at the same time that New York was doing so.

EUROPEAN EXCHANGE MOVEMENTS

Fluctuations.—While stabilization and the movement of money in New York were the two principal forces outside of normal trade making for foreign exchange rate fluctuations, yet, as is always true, there were constant minor fluctuations caused by the demand and supply of exchange created through the uneven exchange of goods as to time and values and transfers of funds in connection with financial operations.

The pound sterling held around $4.88 for the first six months of the year. Beginning June 21 the rate gradually declined, reaching $4.84 13/16 Oct. 5, which resulted in gold shipments being received from London the latter part of the year.

The French franc has been remarkably steady throughout the year, ranging from 3.90½ to 3.94 cents. This was largely due to the strong position of the Bank of France because of its huge holdings of important foreign exchanges. On June 25 the legal stabilization of the French currency on a gold basis became effective, after the Parliament had passed by a large majority the bill submitted by Premier Poincaré fixing the value of the franc at 65½ milligrammes of gold, 9/10 fine. The gold parity between the franc and the dollar is therefore 3.9179 cents per franc, or 25.5239 francs to the dollar, which is approximately equivalent to the rate at which the French currency had been stabilized *de facto* for the previous year and a half.

Scandinavia.—The Scandinavian currencies were fairly stable throughout the year. Stockholm declined slowly from 26.97 cents, reaching 26.77 cents during the second week of July. After remaining at this figure until September 18th, Swedish kroner declined further to 26.73 cents. Copenhagen ranged between 26.85 and 26.66 cents. Oslo rose from 26.62 to 26.80 cents during May and then slowly reacted to 26.66 cents.

Swiss francs ruled firm the entire year. Starting at 19.30 cents they declined to 19.24 cents at the end of January, then gradually rose again to 19.27 cents.

Guilders, after holding at 40.3 cents during January and February declined slowly to the low point 40.23½ cents, on March 15 only to seek higher levels, reaching 40.3 cents on June 2. Thereafter a decline set in, 40.08 cents being reached early in October. The pressure was due to seasonal influences as well as the attraction of interest rates in New York. Guilders closed the year at about 40.16 cents.

German Marks have been remarkably steady throughout the year. The

high of 23.95 cents was reached on May 28, and the low 23.80 cents on Oct. 8.

Italian lire kept steady at 5.28-5.29 cents during the first four months of the year. A decline set in at the end of April sending the rate to a low of 5.22½ cents on Sept. 18, after which it rallied to 5.24 cents.

Spanish pesetas were active throughout the year. From a high of 17.30 cents on Jan. 6, the peseta declined to 16.44 cents on Aug. 6. At that date the announcement of the extension of credits to the Bank of Spain by English and American banks, together with the creation of a governmental bureau for the regulation of peseta exchange, was made. Following this announcement, the peseta rallied to 16.84 cents only to decline later to a slightly lower level of 16.60 cents. Early in September liquidation of peseta positions depressed the exchange still further until it touched 16.10 cents on Oct. 30.

LATIN-AMERICAN EXCHANGE RATES

The Argentine peso remained steady during the first five months of the year, ranging from $1.0270 to $1.0285; on June 20 the rate rose to $1.03; July 9 to $1.04, and in September to $1.0470, which resulted in the shipment of gold.

Chilean pesos were fairly stable throughout the year. They declined from a high of 12.21 cents to a low of 12.04 cents by December.

Other Rates.—Brazilian milreis ranged between 12.05 and 11.90 cents; Colombia, 1.013 to $1.0275; Salvador, 2.00 to 2.03 cents; Venezuela, 5.18 to 5.28 cents; Ecuador, Guatemala, Nicaragua, remained around par all year. The Mexican peso declined from 49 cents in January to 47.35 cents on July 9. It rallied again to 48 cents which was the prevailing rate at the end of the year. Montevideo ranged between a high of $1.0425 reached on March 23 and a low of $1.017 during October, later rallying to $1.027. The Peruvian pound ranged between $3.87 and $4.01.

FAR EAST EXCHANGE RATES

Japanese yen were very active most of the year and subject to much speculation. Fluctuations were wide. After beginning the year at 46.60 cents and rising in January to 47.10 cents, the yen declined during February to 46.80 cents. On March 23 the yen improved and reached a high of 48 cents on March 27, the highest point following the reaction caused by the banking crisis of May, 1927. During the latter part of April the yen began to fall slowly till it reached 44.65 cents on Aug. 17. From that date a slight improvement set in and the yen closed the year at about 46 cents.

The Chinese currencies were influenced by the unsettled conditions caused by the warring factions. Hongkong dollars sold as high as 52½ cents on May 23, and as low as 49⅜ cents on July 23. Shanghai taels ranged between 62¾ cents and 70⅜ cents.

LIFE INSURANCE

By Wendell M. Strong

Associate Actuary, Mutual Life Insurance Company of New York

NEW INSURANCE

For the first nine months of 1928, the total life insurance issued showed an increase over the previous year. The increase took place in each of the three classes—ordinary, industrial, and group insurance. That in ordinary and industrial insurance was small; that in group insurance was very great. This great increase in group insurance was due particularly to the insuring of employees of two of the largest industrial corporations. Group insurance is subject to such fluctuations because a single group, such as General Motors, may consti-

tute an extremely large amount of insurance.

The increased amount in force is in line with the change that has taken place for many years. Such increase has, however, been quite small for the past several years, whereas for some years immediately preceding 1926 it was very rapid. The remarkable thing is, not that the increase is now small, but that there should be any increase at all after the rapid increases of the period preceding 1926.

The following table gives the amount of new insurance written during the first nine months of 1928 by 44 companies holding 82% of the total business in force in the United States:

	1928	1927	Per Cent of Increase Over 1927
Ordinary Insurance	$6,062 millions	$5,881 millions	3.1
Industrial Insurance	2,010 "	1,938 "	3.7
Group Insurance	986 "	534 "	84.8
Total	$9,058 "	$8,353 "	8.5

INCREASE IN INSURANCE IN FORCE AND ASSETS

In Force.—On December 31, 1927, the life insurance companies, excluding fraternals, showed eighty-seven billion dollars of insurance in force and about fourteen billion four hundred million dollars of assets. The increase for several years had been between seven and eight billion dollars a year in insurance in force and about one billion and a half dollars in assets. It may therefore be estimated that on December 31, 1928, the amount in force will be over ninety-five billion dollars and the assets about sixteen billion.

Insurance in the fraternal orders shows very little increase in the last five years.

Dividends.—1928 dividends showed an increase over 1927 and were at the highest average rate of any year in modern times. There have been no announcements of dividend scales for the year 1929, but there is no reason to believe that they will not be as good as in 1928. The following table shows the dividends paid, and insurance expenses (compiled by THE AMERICAN YEAR BOOK) of a large number of representative companies, and the rate of interest earned by one hundred companies, all for the years 1923 to 1927 inclusive. The notable features are the great increase in the total amount of dividends, the much smaller rate of increase under the insurance expenses, and the practically stationary rate of interest.

TABLE OF DIVIDENDS, EXPENSES AND INTEREST RATES

Year	Number of Companies	Dividends Paid (Millions)	Number of Companies	Insurance Expenses (Millions)	Year	Rate of Interest on Mean Invested Funds by 100 Life Insurance Companies
1927	319	$418	192	$397	1927	5.32%
1926	322	376	192	374	1926	5.29
1925	308	351	196	352	1925	5.34
1924	297	320[1]	197	321	1924	5.38
1923	260	274[1]	183	265	1923	5.38

[1] See note 3 under table at end "Surrenders, Loans, and Dividends."

LEGISLATION

Investments.—The New York Statute regarding investments was changed during 1928 to permit life insurance companies to invest in certain preferred stocks. Hitherto New York State companies had not been permitted to invest in any stocks and

only in certain classes of bonds, collateral bonds not being included. With the tremendous investment of life insurance companies, too great a limitation of their investments would evidently have resulted in an unduly low interest rate, and it seemed advantageous to have the field widened.

New York Expense Limitation.—Shortly after the insurance investigation in 1905, statutory limitations both for expenses of new business and total expenses were enacted in New York State, applying to companies doing business in New York State, the object of this legislation being to prevent undue expense. The Superintendent of Insurance of New York State has proposed certain changes in this statute with the idea of carrying out more effectively the principles underlying the law and of remedying certain defects that have been found. The present statute has restricted companies with low premiums in the matter of expense more severely than the companies with higher premiums with the result that the low premium companies have been obliged to write a large amount of term insurance in order to be able to undertake greater expense in the writing of other kinds of insurance. The Superintendent has conferred with a committee of Actuaries regarding the provisions desirable in new legislation and, because of the time required for consideration and discussion, no bill was introduced in the 1928 session of the New York Legislature. It is probable, however, that a bill will be recommended by the Superintendent to the 1929 Legislature.

DISABILITY AND ACCIDENTAL DEATH BENEFITS

Policies with provisions for waiver of premium and income to the insured in event of total and permanent disability, and for additional payment on death in case death is accidental, continue to increase in point of popularity.

Policies with these benefits are now written by nearly all the insurance companies in the United States. As time goes on, the payments by the companies on account of these benefits will of course continue to increase.

The following tables compiled from the reports of seven large companies reporting to the State of New York give an indication of how rapidly the payments have increased during the past six years, particularly in the case of payments under the disability benefits. The rate of increase in the amounts of disability payments, which may not be expected to increase at the same rate in the future, is due principally to three causes: (a) the rapid increase in the amount of insurance providing for this benefit; (b) the adoption quite recently of the clause providing for payments where the total disability lasted more than ninety days, even though it should not eventually prove permanent; (c) other liberalizations of policy provisions. The increase in the payment of accidental benefits is approximately in proportion to the amount of insurance providing for such benefits.

AMOUNTS PAID FOR ACCIDENTAL DEATH AND DISABILITY BENEFITS

(Seven companies with largest amount in force reporting to New York State)

Year	Payment on Account of Total and Permanent Disability [1, 2]	Payment on Account of Accidental Death Benefits [2]
	(Millions)	(Millions)
1927	18	6
1926	15	5
1925	11	4
1924	7	4
1923	5	3
1922	3	2

[1] Includes premiums waived.
[2] Does not include industrial or group business.

LIFE INSURANCE TRUSTS

A very active campaign has been carried on by the trust companies for the creation of Life Insurance Trusts. Such a trust is one where the policies are placed with a trust company as trustee with the arrangement that the proceeds are to be paid to the trust company as trustee when the policies become a claim, and the trust

company then administers the trust that has been arranged by the trust company and the insured during his lifetime. This usually is in the form of some income to the beneficiary or beneficiaries.

MODES OF SETTLEMENT FOR LOSSES

Most life insurance policies issued today contain optional modes of settlement at maturity, which can be elected during the continuance of the policy, such settlements being either the retaining of the proceeds at interest, payment in a stipulated number of installments, or settlement as a life income to the beneficiary. Such settlements are analogous to Life Insurance Trusts, but differ in the fact that the settlement depends upon the whole assets of the company instead of upon a separate trust fund, also in that under such a settlement the company does not exercise the discretion which may be delegated to a trustee. In most companies no charge is made for settlement by any one of such modes of settlement.

The amount of insurance under which such modes of settlement have been elected has increased tremendously in each year of the last decade over the preceding year, and such increase continues in 1928 at an unabated rate, showing the appreciation which the insuring public has of this opportunity to leave the beneficiary a secure income or investment. It is undoubtedly the popularity of these modes of settlement which has led the trust companies to their campaign for Life Insurance Trusts.

AVIATION INSURANCE

Changed Conditions.—The considerable risk of aviation constitutes a new problem to the insurance company. Until quite recently, it was unimportant, because the number flying was so small and the risk was such that most companies declined those flying to any extent, or accepted them only with a very large extra premium. The change in conditions is due to the fact that the number flying occasionally as passengers is increasing rapidly, and has led several companies to adopt a graduated scale of extra premiums for passengers, depending upon the amount of flying that has been done or which is expected to be done. The policy when issued puts no restrictions on the amount of flying to be done. If it seems at the time the policy is taken that the insured will make flights, the proper extra premium is charged.

Determining Risks.—The statistics available for determining the extra risks of aviation are very unsatisfactory. Also with the improvement of the aeroplane, the risk per flight is itself changeable. In consequence, all that the companies can do at the present is to determine, on their best judgment, and taking into account such statistics as are available, which cases can properly be accepted and at what extra premium. With changing conditions for adequate data, it is probable that these extra premium rates will not remain unchanged for very long.

The two things in which there seems to be no difference of opinion are—(a) that under present conditions, the making of more than three or four flights in a year, even as a passenger, indicates an extra hazard which will be compensated for by an extra premium; (b) that the extra hazard for professional pilots of any kind is very high and requires a very heavy extra premium if they are to be accepted at all.

INCOME TAXES OF COMPANIES

Prior to 1921, the income tax law as applied to insurance companies was complicated, and had led to much litigation. In the 1921 Revenue Act Congress provided a special method of income taxation for insurance companies. While the new plan of taxation met with the approval of most insurance companies as being a fair tax and one which had the advantage of being clear as to the amount, some of them, a major portion of whose assets were invested in tax exempt securities, objected to certain features of the law, which, it was claimed, had the effect of taxing these securities. A case was brought to test the va-

lidity of the law, and the Supreme Court of the United States, in the summer of 1928, rendered a decision holding unconstitutional the sections of the law to which objection had been raised. The result will probably be a new statute.

STATISTICS OF INSURANCE

The following tables give statistical information as to various items of the business of both ordinary life and industrial companies and also fraternal orders. Reference has already been made to some of these points.

ORDINARY AND INDUSTRIAL INSURANCE

(Insurance Year Book)

(in millions)

Year	Number of Companies	End of Year		Premiums Received	Total Income	Total Payments to Policyholders	Total Disbursements	New Business [2]	Amount in Force at End of Year [2]
		Admitted Assets	Surplus [1]						
1927	319	$14,392	$1,526	$2,874	$3,673	$1,500	$2,295	$17,135	$87,022
1926	322	12,940	1,364	2,624	3,330	1,373	2,124	16,461	79,644
1925	308	11,538	1,234	2,384	3.018	1,243	1,936	15,473	71,690
1924	297	10,394	1,137	2,122	2,703	1,174	1,813	13,195	63,780
1923	291	9,455	1,078	1,900	2,427	1,088	1,693	12,070	56,804
1922	286	8,652	957	1,686	2,149	973	1,494	9,774	50,291

Note: These tables are compiled for the 1928 edition of THE AMERICAN YEAR BOOK in which the figures for certain years show unimportant differences from earlier editions.

[1] Includes amounts set apart for dividends to policyholders during following year.

[2] Includes group insurance.

SURRENDERS, LOANS AND DIVIDENDS [1]

(in millions)

Year	Number of Companies	Amount in Force at End of Year [2]	Amount of Policies Surrendered [2]	Policy Loans at End of Year	Dividends to Policyholders	Amount Paid for Surrendered Policies
1927	48	$58,649	$1,072	$1,484	$394	$268
1926	44	53,680	864	1,336	362	236
1925	41	47,841	748	1,212	329	207
1924	38	41,787	698	1,108	330 [3]	198
1923	38	37,545	639	1,033	284 [3]	192
1922	37	33,461	614	977	246	191

[1] Only life companies reporting in New York State.

[2] Includes group insurance but not industrial.

[3] Includes dividend funds on foreign business transferred by one large company. This accounts for the apparent discrepancy in the figures for the corresponding years in the earlier table "Dividends, Expenses and Interest Rate" where these dividend funds were not included.

UNITED STATES INDUSTRIAL INSURANCE COMPANIES

(Insurance Year Book)

(in millions)

Year	Number of Companies	New Business	Insurance in Force at End of Year		Premiums Received	Losses Paid
			Number of Policies	Amount		
1927	58	$4,465	82	$15,548	$1,137	219
1926	49	3,954	76	14,035	1,040	203
1925	60	3,656	74	12,824	941	176
1924	54	3,011	68	11,344	818	153
1923	49	2,015	63	10,107	712	142
1922	45	2,268	58	8,887	611	119

INSURANCE BY UNITED STATES FRATERNAL ORDERS

(Insurance Year Book)

(in millions)

Year	Number of Orders	Assessments	Total Income	Claims Paid	Total Disbursements
1927	235	193	238	133	171
1926	249	182	224	121	159
1925	224	188	222	121	160
1924	228	186	216	116	153
1923	227	128	207	110	152
1922	245	173	198	111	152

(in millions)

Year	Assets at End of Year	New Business	No. Certificates in Force at End of Year	Amount in Force at End of Year
1927	$760	$1,026	8	$9,727
1926	660	1,033	9	9,835
1925	628	1,106	8	9,770
1924	566	1,097	13	9,806
1923	491	795	8	8,759
1922	340	916	8	8,688

FIRE INSURANCE

By E. R. Hardy

Assistant Manager, New York Fire Insurance Exchange

Statistical.—The assets of the companies engaged in the business of fire insurance in the United States at the present time slightly exceed $2,000,000,000. Liabilities, including capital, amount approximately to $1,500,000,000. The premiums received are $1,050,000,000, while the total insurance in force is about $205,000,000,000. The estimated wealth of the United States is $320,000,000,000; thus approximately 60% of this wealth is protected by policies of fire insurance. The past year showed no outstanding change so far as the volume of business is concerned. The premiums, due to certain changes in economic conditions and methods of transacting business, appear to have reached a maximum for the present. The tendency to better building construction and more highly protected properties reduces the rates of insurance, although the liability increases.

Financial Aspects.—There were two important developments during the year, both of which have an important bearing on the financial aspects of fire insurance. The first is the tendency to form groups to a greater extent than has been possible in previous years. Indeed, the greatest union under one group of several companies was accomplished during the past year. Along with this movement there has been another, and that is that a large number of companies have been organized, and the older companies have increased their capital and surplus. Some 44 companies, for instance, established previous to this year, increased their capital and surplus about $75,000,000. The 9 new companies of large size which were established began business with a capital and surplus of something over $20,000,000. It is estimated that the new money put into the business of fire insurance amounted to approximately $120,000,000. Larger capital, it should be pointed out, is necessary because of the increased size of properties to be insured, and the steady growth in insurable values in the country.

Stock Dividends.—The declaration of stock dividends attracts unusual attention when announced, but these dividends, after all, are a transfer from surplus to capital, and thus are not funds taken out of the business. Those funds might have been divided among the stockholders, but they deemed it better to strengthen the institution by putting these funds into a fixed liability, and retain them as capital.

Fire and Storm Losses.—The losses due to fire insurance during the year were normal. No serious fires in any one part of the country, nor anything approaching a conflagration hazard occurred. Among the so-called side lines of fire insurance, the insurance of damage due to hurricane or windstorm again made itself felt. The State of Florida was visited by a hurricane, damage running into many millions. It was only two years ago that a similar cause called for the payment of many millions in that State. Some forms of disaster appear to be local in character. This is true of windstorms, which occur in several parts of the country with more or less frequency. It is also true of lightning.

MARINE INSURANCE

By Douglas F. Cox

President, U. S. Merchants and Shippers Insurance Company

UNDERWRITING RESULTS

As usual, it is not possible to be at all definite in regard to the business written in the year under review as the annual statements of the companies for 1928 will not be published until 1929 is several months old. The general impression current in marine insurance circles up to the autumn was that the year was going rather better than has been usual in recent years, but during the closing months there have been several heavy losses in addition to a vast number of smaller ones resulting from the extremely severe weather which has been prevalent, notably on the North Atlantic and the North Sea, around the British Isles and along the coast of Europe. These will undoubtedly have the effect, in many instances, of turning expected profits for the year into losses, at least in the ocean marine section of the business. Prominent among the severe losses are the *Vestris* and the *Celtic*, which have figured so largely in the newspapers.

The figures for 1927, published in 1928, show a slight increase in the number of companies reporting marine business, a considerable increase in the volume of inland marine but a small decrease in the volume of ocean marine. Losses incurred are not available in tabulated form, but losses paid compared with premium written show a ratio for the two classes taken together of 62% and for ocean marine separately of 75%. This certainly indicates a loss in the ocean section and with an expense ratio of anything over 38%, a loss on the whole business. There were, as usual, some notable exceptions, but for most of the companies it would seem that 1927 was unprofitable. Six companies reported ocean only, 42 inland only, and 84 both classes, making a total of 132, but 22 wrote 61% of the ocean business and 71% of the inland, showing that of the companies which have or could easily acquire the right to do marine business, comparatively few are greatly interested in that class.

FOREIGN MARKET

Because of the facility with which marine insurance can be placed abroad covering vessels and cargoes belonging to our citizens, the results of the transactions of the companies there, especially in London, are interesting to us here. There are no tabulated figures available, but there is no doubt that they have with few exceptions been losing heavily. A very interesting consular report, filed

in Washington, shows astonishingly large amounts lost in recent years by British companies in their marine business and indicates a very real necessity for their drastically raising rates and improving conditions. This has been done in regard to hulls, but in regard to cargoes, the process of improvement, while apparent here and there, is as yet very slow.

PROSPECTS

While, as stated above, no figures are available for 1928, it can be said that in this market, the American Marine Insurance Syndicate "C," through which the companies do the bulk of their ocean hull business, is making what seems to be sound, conservative progress. It is receiving an increasing volume of premium and is, generally speaking, able to obtain better rates on fleets whose records show the necessity for an increase. As to cargo, while competition is keen and rates on too low a level, the efforts of the last year or two to improve conditions in certain theretofore unprofitable classes have borne some fruit; for instance, in the burlap trade in which the rates are being maintained and the losses during the past year have been much fewer. In other similar cargo classes, there is hope that the long-sustained efforts for improvement may also meet with some success within a reasonable time.

GOVERNMENT IN INSURANCE BUSINESS

It seems strange that a business in which conditions have been and still are so difficult should be attacked on the grounds of profiteering and monopoly, but that is just what occurred in hearings before the House Committee on Merchant Marine and Fisheries at the last session of Congress. The government is anxious to assist the Merchant Marine and the Shipping Board is especially anxious to assist the shipowners who are operating steamers purchased on the part-payment plan from the Board. It appears that certain of those shipowners, who had been obtaining insurance at less than cost during recent years in the demoralized London market, found that this "subsidy" was being cut off by the rise in London rates and, as American underwriters were unwilling to accept the business except at the more nearly adequate rates which they have all along required, those shipowners appealed to the government through the Shipping Board for assistance, asking that the government furnish insurance at rates which they would be willing to pay. The Shipping Board has a fund in which vessels owned wholly by the government are insured and the result of the appeal was the enactment of legislation under which vessels and other property in which the government has a "legal or equitable interest" may be insured in that insurance fund at rates named by the Shipping Board. This puts the government squarely in the Insurance business, for, while previously it merely set aside in a special insurance account "premiums" on its own property and charged the losses to the same bookkeeping account, it now actually furnishes insurance on the property of private individuals or corporations and receives premiums therefor. This is a severe blow to Marine Insurance in this country and if the principle thus established is carried further by future legislation, it is unpleasant to attempt to picture the ultimate result.

GERMAN WAR CLAIMS

About 30% of the recoveries from the German Government for losses incurred during the war, awarded to marine insurance companies by the Mixed Claims Commission, which have been pending in Washington for some time, has been paid during 1928. Further substantial payments are expected during 1929, but the remainder will only be received in payments spread over probably twenty-six years.

CASUALTY INSURANCE

By A. Duncan Reid

President, Globe Indemnity Company, Newark

COMPULSORY AUTOMOBILE INSURANCE

Massachusetts Act.—In 1928, as in 1927, the spotlight of public interest in the field of casualty insurance has been turned so frequently and searchingly on the application of the Compulsory Automobile Insurance Act in the State of Massachusetts as to make it one of the most interesting and significant casualty features of the year. The developments up to the time when this article is being prepared have been so important as to justify several comments to supplement what was recorded in 1927 (The American Year Book).

Effect on Insurance Rates.—The act, which went into effect on January 1, 1927, required that liability insurance covering personal injuries to members of the public be carried as a condition of registration of every motor vehicle in the State, with the exception of a few classes. Such legislation by the State naturally carried with it the responsibility for the promulgating of rates to be charged for such compulsory liability protection which responsibility was delegated to the Superintendent of Insurance. The fact that preliminary rates issued for use during 1927 under this statute were considerably lower, on a state-wide basis, than rates previously charged by insurance companies when the carrying of liability protection was on a voluntary basis, led to many varying conjectures as to whether an underwriting profit or underwriting loss would result.

The Rate Problem.—Before the close of 1927, the view held by a considerable number of insurance companies writing this form of coverage was that the prevailing rates were so low as to make underwriting loss not only possible but imminently probable. The action taken by such companies ranged from substantial restriction of activities in the Massachusetts automobile liability field to outright withdrawal from the State.

In 1928 the rate problem developed into a serious and complicated situation. After reviewing the experience of insurance companies issuing the policies, the Insurance Commissioner, early in September, announced his intention to issue rates to become effective January 1, 1929, which for the most part would represent a substantial increase and explained that such new and increased rates would be necessary to meet accident claims and to protect the insurance companies against loss. Immediate and vigorous protest from the parties unfavorably affected by such increased rates followed this announcement and new complications ensued by reason of the resignation, under pressure, of the commissioner before the rate change had been made. The resulting uncertainty as to what rates would apply in 1929 was cleared up by a ruling of the State Supreme Court and in late November the Acting Insurance Commissioner published rates for 1929 which are a modification of those recommended by the Insurance Commissioner prior to his resignation.

Underwriting Loss.—A report published by the Massachusetts Insurance Commissioner before his resignation disclosed the following interesting facts: that the total of earned premiums accruing to all insurance companies on automobile liability policies issued in that state for or during 1927 amounted to $16,806,377; that the losses on claims presented under those policies totalled $11,538,131, which, added to the $6,902,078 total expenses of the companies, developed an underwriting loss of $1,633,832.

Legal Aspects Affecting Claims.—The number of claims presented to insurance companies in Massachusetts has been consistently so far in excess of the number of injuries reported to State authorities as to account for

the belief, on the part of many who have studied the subject, that under this system of compulsory liability insurance the companies are called upon to handle an excessive number of claims of a frivolous and exaggerated nature, which offer an attractive working field for the "ambulance-chasing" type of lawyer. It should be noted that insurance covering liability for damage to property is not required by the Act. In the light of this fact, therefore, it has been argued that claims which properly come under automobile property damage insurance, after falling into the hands of unscrupulous lawyers, have been brought against the insurance companies on false allegations of personal injury. The seriousness of this situation, and the hardships which it worked upon the companies, attracted the attention of the Attorney-General who enlisted the aid of the president of the Massachusetts Bar Association in an investigation of this phase of compulsory insurance.

Accidents Increase.—Those proponents of compulsory automobile insurance who have contended that such legislation will operate to reduce the number of reckless and incompetent drivers, and possibly to eliminate them altogether, will find little in the 1927 statistical record to support their contentions. Comparing the year 1927 with 1926 it has developed (according to recently published figures) that in 1927, with fewer automobiles registered, there were 698 automobile fatalities as compared with 691 in 1926—that personal injury cases jumped from 24,904 in 1926 to 32,922 in 1927, and that collisions increased from 26,769 to 33,936.

The Outlook.—In its two years of operation, the application of the Massachusetts Compulsory Act has brought about many developments which could hardly have been foreseen either by those who favored or by those who opposed its enactment, and 1929 will probably witness an interesting continuance of the evolutionary process. In Connecticut, Maine, Minnesota, Rhode Island and Vermont acts have been passed which, although differing from each other in many particulars, embody the common principle that compulsory insurance shall apply only after the sort of accident which, upon investigation, discloses a special need for an assurance of financial responsibility on the part of the car owners. None of these six states requires insurance from all automobile owners. There has been widespread acceptance of the idea that owners of automobiles used for interurban transportation of passengers should be compelled by the state to carry liability insurance, and this type of compulsory automobile insurance has for some time been required by the legislative acts of thirty-five states.

WORKMEN'S COMPENSATION

Rate Problem.—In the Workmen's Compensation field the companies are still struggling with the problems involved in the apparent inadequacy of rates. They are, however, gradually reaching the point where the carriers may at least hope to avoid an underwriting loss on their compensation business.

District of Columbia and New York.—During the year, the District of Columbia embraced the principles of Workmen's Compensation, leaving now only five states—Arkansas, Florida, Mississippi, and North and South Carolina—without any Workmen's Compensation Law. An amendment to the New York law, effective last October, brings within its scope certain employments hitherto excluded because they were not conducted for pecuniary gain. This would relate particularly to hospitals, churches and other eleemosynary institutions.

Risk "Constant."—An important step in the matter of compensation underwriting has been the approval, by many of the state insurance departments, of the use of a fixed charge or "constant" for the risk which normally would produce a very meager premium. This small risk problem has been considered long and carefully and it would appear that the application of this "constant" is a solution fair alike to the companies and the employer.

PUBLIC LIABILITY

The various classes comprising miscellaneous public liability and property damage insurance—such as landlord's and tenant's, manufacturer's and contractor's, elevator, foreign substance and so forth—are commanding more attention every year as the public become educated to their needs in these directions. More and more does the question of public liability become vital and the call for insurance correspondingly urgent. The high verdicts which are being rendered, often under most unusual circumstances, are bringing the public to a realization of what this particular form of coverage means to them.

FINANCIAL

Underwriting Gains.—The remarkable growth of casualty, surety and miscellaneous business in the United States which marked the year 1926, continued through 1927. According to *Bests' Insurance Reports* an aggregate of $867,330,043 was written by all companies in 1927 as compared with $782,852,347 for the previous year. This represents a gain of over $84,000,000—an increase of approximately 10½%. The division of this business by lines, as compared with the year 1926, is shown in the accompanying table. If the percentage increases of the last few years are continued, the total writings of all companies in the United States for the year 1929 will approach the billion dollar mark. The reaching and passing of this goal may indeed be regarded as an epoch in the eventful history of casualty insurance.

New Capital.—The year 1928 witnessed an unprecedented influx of capital for new insurance companies. According to a bulletin published on October 28, 1928, by one of the large investment houses of New York City, $144,960,000 had been subscribed, or was then being subscribed, for new insurance companies. Although more than half of the new money had been subscribed for fire companies, thirty-one new casualty companies had at that time been added to the list, the total paid-in capital and surplus amounting to $25,950,000 with an additional $39,200,000 in immediate prospect of being subscribed.

These figures below themselves evidence the increasing public recognition of the economic importance of the forms of protection written by casualty and surety companies.

CASUALTY INSURANCE

Class of Business	Premiums Written 1927	Premiums Written 1926
Accident and health	$127,572,296	$137,137,609
Auto and teams property damage and collision	71,927,112	68,386,351
Burglary and theft	35,423,548	30,935,744
Check alteration *	36,339	22,723
Credit	5,044,378	4,925,525
Engine and machinery	3,188,009	3,723,097
Fidelity and surety	96,914,689	96,900,875
Liability	230,363,679	204,664,991
Live stock	868,006	1,099,190
Plate glass	16,530,788	18,565,055
Sprinkler	1,148,843	925,620
Steam boiler	6,932,692	7,163,884
Workmen's compensation	212,284,709	199,498,795
Workmen's collective	226,758	230,748
Unclassified	58,869,197	8,672,140
Grand totals	$867,330,043	$782,852,347

* Reported by most companies under the head of fidelity and surety.

COGNATE SOCIETIES

AMERICAN ECONOMIC ASSOCIATION.—Northwestern University, Evanston, Ill.

AMERICAN FAIR TRADE LEAGUE.—71 W. 23rd St., New York, N. Y.

AMERICAN INSTITUTE OF ACCOUNTS.—135 Cedar St., New York, N. Y.

AMERICAN INSTITUTE OF WEIGHTS AND MEASURES.—115 Broadway, New York, N. Y.

AMERICAN PROTECTIVE TARIFF LEAGUE.—33 E. 10th St., New York, N. Y.

AMERICAN REALTY CO.—1440 Broadway, New York, N. Y.

AMERICAN RETAILERS' ASSOCIATION.—128 W. 31st St., New York, N. Y.

AMERICAN STATISTICAL ASSOCIATION, INC.—236 Wooster St., Washington, D. C.

CENTRAL ASSOCIATION OF ACCOUNTANTS.—51 Chambers St., New York, N. Y.

CHAMBER OF COMMERCE OF THE U. S. A.—1615 H. St., N. W., Washington, D. C.

COOPERATIVE LEAGUE OF AMERICA.—167 W. 12th Street, New York, N. Y.

CONSOLIDATED STOCK EXCHANGE OF NEW YORK.—Exchange Floor, 14 Pearl St., New York, N. Y.

CONSUMERS' LEAGUE OF NEW YORK.—289 Fourth Ave., New York, N. Y.

ECONOMY LEAGUE.—1021 Park Ave., New York, N. Y.

FAIR TARIFF LEAGUE.—2 Rector St., New York, N. Y.

FEDERATION OF AMERICAN INDUSTRIES, INC.—511 Fifth Ave., New York, N. Y.

FRANCO-AMERICAN BOARD OF COMMERCE AND INDUSTRY.—90 Fifth Ave., New York, N. Y.

FRENCH CHAMBER OF COMMERCE.—4 E. 52nd St., New York, N. Y.

GENERAL SOCIETY OF MECHANICS AND TRADESMEN OF THE CITY OF NEW YORK.—18 W. 44th St., New York, N. Y.

HOME MARKET CLUB.—38 Chauncey St., Boston, Mass.

INSTITUTE OF ECONOMICS.—26 Jackson Place, Washington, D. C.

INTERNATIONAL ACCOUNTANTS' SOCIETY.—50 Broadway, New York, N. Y.

INTERNATIONAL FREE TRADE LEAGUE.—Wilmington, Del.

ITALIAN CHAMBER OF COMMERCE IN NEW YORK.—27 Cleveland Place, New York, N. Y.

LEAGUE FOR INDUSTRIAL RIGHTS.—165 Broadway, New York, N. Y.

MERCHANTS' AND CONSUMERS' LEAGUE.—500 Fifth Ave., New York, N. Y.

NATIONAL ASSOCIATION OF COST ACCOUNTANTS.—25 W. 43rd St., New York, N. Y.

NATIONAL ASSOCIATION OF CREDIT MEN.—1 Park Ave., New York, N. Y.

NATIONAL ASSOCIATION OF REAL ESTATE BOARDS.—310 S. Michigan Ave., Chicago, Ill.

NATIONAL ASSOCIATION OF RETAIL GROCERS.—601 Gumbel Bldg., Kansas City, Mo.

NATIONAL BUREAU OF ECONOMIC RESEARCH, INC.—474 W. 24th St., New York, N. Y.

NATIONAL CONSUMERS' LEAGUE.—156 Fifth Ave., New York, N. Y.

NATIONAL ECONOMIC LEAGUE.—6 Beacon St., Boston, Mass.

NATIONAL FOREIGN TRADE COUNCIL.—1 Hanover Square, New York, N. Y.

NATIONAL RESEARCH COUNCIL, 29 W. 39th St., New York, N. Y.

NATIONAL WHOLESALE GROCERS' ASSOCIATION OF THE UNITED STATES.—6 Harrison St., New York, N. Y.

NEW YORK STOCK EXCHANGE.—11 Wall St., New York, N. Y.

PAN-AMERICAN ADVERTISING ASSOCIATION.—32 Burling Slip, New York, N. Y.

PETROLEUM EXPORT ASSOCIATION, INC.—25 W. 43rd St., New York, N. Y.

PROTECTIVE TARIFF LEAGUE.—137 Centre St., New York, N. Y.

UNITED COMMERCIAL TRAVELERS OF AMERICA.—632 No. Park St., Columbus, O.

DIVISION XI

AGRICULTURE AND ALLIED INDUSTRIES

CONDITIONS OF AGRICULTURE

By William M. Jardine

Secretary of Agriculture

GENERAL DEVELOPMENT

Financial Returns.—American agriculture in 1928 apparently received a gross income somewhat larger than that of the previous year. The most outstanding development was general improvement in the livestock industries. Substantially larger returns than those of 1927 were earned by dairymen, beef producers, and poultrymen. In the later months the hog industry entered the upward phase of the familiar hog cycle, and in September hogs were worth 50 per cent more than during the previous winter. Though returns from cash grains, hay, tobacco, and potatoes were smaller than in 1927, this fact, from the standpoint of agriculture as a whole, was more than offset by increased returns from other crops.

Crop Value.—Total production of all crops was about 5 per cent greater than in 1927. For the first 9 months of the year the relative purchasing power of farm products was fractionally higher than the average for 1927. Hence the year registered an increase in both the volume and the value of farm production.

Gains in Stability.—Conditions can never be uniform in an agricultural industry as large and varied as that of the United States. In 1928, however, the situation was less uneven than in any year since 1920. Fewer distress areas existed and most regions effected progress in the adjustment of their agricultural enterprises to market requirements. New gains were made in the efficiency of production. Difficulties resulting from the postwar deflation, although still serious, showed signs of yielding to improved technique in production and in marketing.

AGRICULTURAL REVENUE

Gross Income.—Comparison of the year's estimated cash results with those of other recent years is necessary to place the current situation in its proper setting. This comparison shows us where agriculture is moving, as well as where it stands. Latest comprehensive figures available relate to the crop year 1927-28. In that period the gross income of American agriculture from all products amounted to $12,253,000,000, compared with $12,127,000,000 in the crop year 1926-27 and $12,670,000,000 in the crop year 1925-26. The total for 1925-26 was the highest since 1919-20. Agriculture's gross income in 1919-20, in which year the postwar boom reached its peak, was estimated at $15,700,000,000. It dropped to $9,200,000,000 in 1921-22, then gradually recovered until 1925-26. From that point it dropped about 4 per cent the following year, and in 1927-28 regained 1 per cent from the previous year's recession. Gross income figures, though not a measure of agricultural prosperity, indicate trends and therefore have an undeniably important place in the financial record.

Earnings Distribution.—In the last two years the gross income of agriculture has changed but little, but important fluctuations have taken place in its distribution. In 1926-27,

for example, the income from grain, cotton, fruits, and vegetables was materially below that of 1925-26. In 1927-28 grain and cotton growers made considerably better earnings, whereas returns from hogs, fruits, vegetables, and poultry were relatively low. Regional variations in returns characterized the past year. As I have already noted, increased returns from the livestock industries were materially offset by reduced returns from certain field crops, though the gross income from agriculture as a whole was larger than that of the previous year.

CROP PRODUCTION

Crop Yields.—The production of field crops, despite unfavorable weather in some areas, was large. Yields per acre were about 3 per cent above the average for the last ten years, and about 1.7 per cent above those of 1927. Good yields were harvested, except in the eastern and central parts of the Cotton Belt, in parts of the eastern Corn Belt, and in areas affected by drought comprising most of South Dakota, western Nebraska, eastern Colorado, New Mexico, and southern Texas.

Acreage.—Acreage of crops harvested was the largest on record, exceeding that of 1927 by no less than 8,000,000 acres or 2.4 per cent. The increase was larger than that of any year since 1918, despite the fact that sharp changes in temperature in the spring destroyed the winter-wheat seeded on fully 10,000,000 acres. In estimating the significance of the increase, however, it should be recalled that the area harvested in 1927 was diminished by the Mississippi floods. The expansion of acreage, although not in all respects desirable, unquestionably indicated confidence among farmers in the future of their industry. The increase was well distributed throughout the country and was divided principally among cotton, spring wheat, potatoes, and other leading crops. Incidentally, it is worth noting that the Department of Agriculture advised against increasing the acreage of wheat and potatoes and certain other crops, the returns of which fell below those of the previous year.

Cotton was planted on about 46,700,000 acres, an increase of 11.4 per cent over the acreage planted last year. This expansion made the area in cotton only 4 per cent below the record acreage of 1926, which, combined with high yields, brought a disastrous fall in cotton prices. In 1928, however, losses from the boll weevil were heavy; in fact, heavier than in any year since the first period after that pest spread through the Cotton Belt. Moreover, growing conditions were unfavorable. As a result the cotton crop, despite the increase in planting, was estimated in November at 14,133,000 bales, compared with 17,977,000 bales in 1926. The 1927 crop of 12,955,000 bales was held down by acreage reduction, boll weevil damage, and the Mississippi floods. As the year drew to a close, cotton prices were somewhat lower than in the corresponding period of 1927, but the increased production, offsetting the lower price, promised encouraging returns to growers.

Wheat.—Wheat production for the first time since 1919 exceeded 900,000,000 bushels, the increase being mostly in hard winter and in durum. This large production coincided with heavy yields in other countries. Canada, our most important competitor, had a record crop, although not of the best quality. Europe, outside of Russia, had a crop somewhat larger and of better quality than that of 1927. It appeared in November that the world's supply of wheat for the 1928-29 marketing season would be about 5 per cent greater than that of the preceding season. This increase on the supply side was materially offset by the prospect of an increased demand. Consumption of wheat in Europe was stimulated by a relatively low price and by reduced corn production. Russia's rye crop was short, and Turkey and north China had short wheat crops. In recent years the world's demand for wheat has increased at the rate of about 4 per cent per annum. Hence the prospect was for consumption of the season's large wheat production to an extent

calculated to leave only a comparatively small increase in the carry-over.

In the marketing months, wheat prices in the United States averaged considerably lower than those of the corresponding months of 1927. Although due in some degree to the prospective increase in the world's production, the depression was greater than supply-and-demand conditions seemed to justify. Apparently the market had not sufficiently allowed for the prospect of an increased demand. In other seasons resembling the current season in wheat-supply conditions, prices advanced after depression in the early marketing months. It seemed probable that in this respect the crop season 1928-29 would run true to form and give late marketers a reward for having withheld their wheat from the harvest—season rush.

Corn.—Corn production, estimated at about 2,900,000,000 bushels, was the largest crop since 1923 and was fairly abundant in proportion to the number of livestock on farms. It promised, therefore, to stimulate livestock production. Corn was grown on an acreage a little larger than that of 1927, and the yields, although uneven, averaged a little better. A record crop was harvested in Iowa, and good yields were raised in Illinois, Missouri, Kansas, Oklahoma, and Texas. Indiana's crop was about equal to the average of the last ten years. Wisconsin's crop was slightly above the 10-year average. Yields were disappointing in other important corn-raising States.

Other Grains.—Oats, as well as corn, were a plentiful crop. Feed grains, however, are of course largely raw material rather than finished products on our farms, and their value to the agricultural industry must be largely appraised in terms of livestock results. Estimates for buckwheat, rice, and beans all showed a production less than last year, although sufficient for current needs.

Fruit and Vegetables.—Fruit production was heavier than last year but less than in 1926. Potato production made a record. Possibly 15 per cent of the potato supply was either utilized as feed for livestock or wasted. Sweet potatoes were a light crop, acreage having been reduced following the excessive production of 1927, and yields held down by unfavorable weather. Other vegetables were grown on an increased acreage, but gave rather light yields. Tobacco, planted on an increased acreage, was harvested in rather low yields, so that the crop in weight was not above normal requirements. Considerable differences existed among the various types from the standpoint of quality and stocks on hand.

LIVESTOCK

Price Trends.—A few additional remarks may be useful in regard to the livestock industry, the satisfactory condition of which has already been noted. Cattle prices continued the advance which started late in 1926, and by last midsummer reached the highest average level ever recorded in peace time. Hog prices, early in the year, touched the bottom of a long decline, which had started 18 months previously, and turned upward. Lamb prices were well maintained notwithstanding increased production. Wool prices were higher. Range conditions generally were fair to good throughout the year; all sections were free from serious droughts. Abundant supplies of corn, hay, and other feedstuffs were harvested.

Production Adjustments.—In short, the livestock industry was in the best-balanced condition it had held for many years. Production of cattle, hogs, and sheep had been adjusted more nearly in line with consumer demand for meats at prices assuring reasonable profits to the livestock producers. Total production of meats from inspected slaughter for the calendar year 1928 was slightly larger than in either 1927 or 1926. Total gross income from livestock sales was larger than last year, and was almost equal to that of 1926, which was the highest in recent years as a result of that year's high level of hog prices. In 1928 the proportion of

the gross income distributed to cattlemen more nearly equaled that going to hog producers. Sheepmen also received a larger share.

Prosperity was brought to the livestock industry through readjustments in production whereby producers reduced their breeding herds and disposed of burdensome surpluses. This readjustment was completed first in the sheep industry about 1922. It was not until 1927 that market supplies of cattle were reduced sufficiently to cause a material rise in the general level of cattle prices. The production cycle of hogs is of much shorter duration than that of cattle and sheep. Hence the swine industry, within the last six years, has experienced two periods of surplus production and low prices, and one period of small supplies and high prices. It was now entered its second period of reduced production. An upward swing of prices is in progress, which assures hog producers a favorable outlook for the coming year.

THE DAIRY INDUSTRY

Conditions. — Generally favorable conditions prevailed for the dairy industry. Prices were good and the returns to producers relatively better than those of some other leading farm enterprises. Supplies of roughage and hay were large, and this fact, despite high prices for concentrated feeds, gave dairymen a margin of returns over feed costs as wide as, or wider than that of several recent years. Although total milk production was about the same as in 1927, output of cheese, dry milk, and ice cream increased, while that of condensed and evaporated milk and butter decreased. A steady upward trend in the consumption of market milk and cream was recorded, but data are not yet available to show whether this increase sufficed to offset the indicated decrease in the consumption of butter and condensed and evaporated milk.

Market Developments. — Dairy products have brought remunerative prices throughout the entire period of the postwar agricultural depression, and significant regional developments have taken place. Long distance shipments of fluid milk and cream have affected the demand for cream in areas near large consuming markets. Shipments of sweet cream now appear in the Atlantic seaboard markets from the West North Central States. A notable shift in dairy-producing areas has taken place toward the South, where new creameries, cheese factories, and condenseries have been established. This is in part a result of the fact that market milk commands a price above what can be obtained for milk sold in the form of manufactured products. Such developments, with the changed competitive conditions which they involve, are natural in a progressive and growing industry. In general, the dairy situation remains one of the brightest spots in the agricultural picture.

POULTRY

The poultry industry did considerably better in 1928 than it did in 1927. In the fall of 1927 stocks of eggs in storage were heavy and prices low, and poultry also was relatively low in price. Stocks were reduced rapidly as the season advanced, however, and toward the end of the year were small. In 1928 the prices of both poultry and eggs averaged higher than in 1927. A trend toward greater specialization, strongly marked in the poultry industry during the last few years, continues, particularly in egg farming. In this branch of the industry, the size of the average individual farm is increasing, as well as the number of specialized farms. Accordingly, egg production on specialized farms grows steadily in importance and market influence, though the farm flocks of the Middle West still furnish the bulk of the eggs and poultry entering into commercial channels. Specialization in the poultry industry is promoted by such developments as the recent improvement of the mammoth incubator, the use of coal-stove brooders whereby chick rearing on a large scale at a low cost is possible, the systematic breeding of poultry for increased egg production, the use of electric lights to

induce out-of-season laying, and better knowledge of nutrition.

FRUIT INDUSTRY

Outlook.—Our fruit and vegetable industry continues to progress in specialization, in the technic and efficiency of production, in the standardization, quality, and pack of its products, and in the breadth of its marketing program. Little has yet been done, however, to stabilize production or to prevent the recurrent glutting of markets. On the Pacific coast fruit production is increasing. It is increasing also in the citrus areas of the South and in many of the best fruit sections in the East. On general farms where fruit is raised as a side line the trend seems to be downward. Fruit consumption per capita is increasing, although the rate of increase is difficult to measure, owing to the rapid change that is taking place in fruit-consumption habits.

Market Conditions.—The variety offered for sale, coupled with increased per capita purchasing power, has shaken the preferred position of some favorite fruits. Lunch boxes contain fewer apples and more oranges and bananas. Fewer pies are made with dried apples and more with other dried, canned, or cold-pack fruits. Prunes and raisins have gained greatly in popularity. Northern peaches feel the competition of southern peaches, and southern peaches feel the competition of western cantaloupes. Juice grapes encroach upon the market for cider apples. Hawaiian canned pineapples compete with western canned peaches. Oranges and grapefruit have replaced other products. Fresh, dried, and canned fruit has become available in steadily increasing variety and quantity and on a constantly rising level of quality.

Production Competition.—Naturally, however, this development has been accompanied by steadily increasing competition among the producers. In areas where crops are irregular or not of the best quality, many growers have been crowded out. Yet the volume of production continues to increase. When high prices for any kind of tree fruit prevail for several years in succession, the result is usually a great expansion of the acreage set to young trees. Production continues to expand as the new trees come into bearing and grow larger, and may exceed the requirements. Finally correction is brought about, but in a costly and discouraging manner, by the neglect or removal of trees and the bankruptcy of many producers. Partial relief is obtained by a constant struggle for a wider distribution and a continuous effort to improve the quality of the offering. This policy, unquestionably sound and effective as far as it goes, needs, however, to be supplemented by a more far-sighted adjustment of production plans to market needs.

AGRICULTURAL EXPORTS

Value and Volume.—Exports of agricultural products in the 1927-28 season declined as compared with those of the preceding year. Shipments of pork products, wheat, and cotton dropped by an amount that more than outweighed increased shipments of certain less important export items. In value our agricultural exports for the year were 4 per cent less than those of the preceding year and were the smallest in the last five years. The proportion borne by our agricultural exports to our total exports of all commodities amounted to only 38 per cent. This percentage, with the exception of the figures recorded for 1916 and 1917, is the lowest on record.

Cotton.—Cotton exports declined 30 per cent in volume, although in value the decline amounted to only about 5 per cent. This is a reflection of the higher price level prevailing in 1927-28. When the season opened, foreign cotton-consuming countries, which had bought heavily of our 1926 crop, had considerable stocks on hand, which reduced their import requirements. Takings by Great Britain and Japan, where the textile industries have been seriously depressed, show the greatest reduction. Shipments to continental Europe and Japan, where the textile industries have been seri-

ously depressed, show the greatest reduction. Shipments to continental Europe declined less, and cotton consumption there, particularly in Germany, continued high. Foreign stocks of cotton have now been considerably reduced and the American cotton export outlook is consequently somewhat improved, although the textile industries in many of our leading markets remain depressed.

Wheat and Other Grains.—Wheat exports declined about 6 per cent as compared with the previous year. The principal factors contributing to this decline were larger bread-grain crops in European importing countries and increased production in Canada and Argentina. On the other hand, the European market for feed grains was better, and our exports of barley and corn increased. Rice shipments to Latin American and European markets increased, although at lower prices, but exports of California rice fell materially.

Tobacco.—Our exports of flue-cured tobacco increased 14 per cent over those of the preceding year. The United Kingdom and China, our leading markets for this type of tobacco, took substantially larger quantities, and our exports of cigarettes to China increased. American flue-cured tobacco has been put in a favorable position by increased use of cigarettes and by limited foreign production of similar tobacco. But exports of this type were offset by reduced shipments of the darker pipe and chewing tobacco, which are meeting increased foreign competition.

Fruit.—Apples, the leading item in our fruit exports, were exported in reduced volume, but encouraging gains were recorded in the exports of a number of other fruits, including grapefruit, prunes, and raisins. Exports of prunes and raisins were the largest on record and were 48 and 28 per cent, respectively, larger than in the preceding year. Better quality and better packing have put American fruit in a more favorable position in foreign markets.

Pork Products.—Lower exports of pork products reflected increased competition from the Netherlands, Denmark, and the Irish Free State in the British bacon trade, and also increased hog raising in European countries. Shipments of bacon and ham were considerably smaller. Our lard exports increased 6 per cent in volume but declined slightly in value. Hog production in continental Europe, although smaller in 1928 than in 1927, seems likely to continue more nearly adequate to domestic requirements than it was in the years immediately following the war. This fact has an important bearing on the outlook for our export trade in pork products.

FARM LAND VALUES

Effect of Tenancy Changes.—The post-war readjustment of land values has been accompanied by changes in the tenure status of farmers. From 1921 to 1925 the percentage of tenants in the country increased from 38.1 to 38.6. In this period tenants migrated in such large numbers from most of the old Cotton Belt as to leave much of the poorer land unfarmed. Tenancy increased in the new Cotton Belt, in the West North Central States, and in the mountain divisions. Areas near industrial centers, on the other hand, showed an increase in owner-operator farmers. This movement was most noticeable in the North Atlantic States, where many influences promote it. Cheap automobiles and good roads solve the transportation problem and the progress of invention makes city conveniences available to farm homes near cities. Moreover, a small land holding may contribute toward living expenses. But the output of such truck-gardening farms adds comparatively little to the nation's commercial agricultural production. Such evidence as is available indicates that since the census of 1925 tenancy has continued to increase in some regions, and that taking the country as a whole there has been no increase in owner-operator farmers.

Questions of Tenure.—In appraising the present situation as to farm-land values, it should not be assumed that the growth of tenancy is necessarily an unfavorable sign. In many

regions productive farm land can be rented more cheaply than it can be owned when terms of cost, including taxes, depreciation, and repairs, are taken into consideration. Ownership has many advantages. Nevertheless, it may be better to be a renter on good land than an owner on poor land for which too much has been paid. After all, the farmer's problem is to lay out his available capital in the most economical and productive manner. It is not by any means always best to invest heavily in land. Many inquiries come to the Department of Agriculture from city dwellers and farmers living in areas where land is still relatively high in price as to the desirability of purchasing presumably run-down farms or abandoned land. Bargains can doubtless be obtained by men who know land values. Prospective buyers should bear in mind, however, that not all land obtainable at a low price per acre is truly cheap.

Factors in Ownership.—Such figures as are available on recent tenancy changes indicate that many farmers are unwilling to pay too much for the privilege of owning. In the first 20 years of this century farm-land values in certain important Western States rose faster than land incomes. The net rate of return upon the farm real-estate investment declined steadily until it reached a level materially below the prevailing rate of return on such investments as first mortgages. A change has come about in recent years with the decline in farm-land values. At present valuations the return obtainable on an investment in farm land is somewhat more in line with the prevailing rate of return on other investments. Undoubtedly, however, the problem of tenancy is in part a reflection of unwillingness among farm operators to pay interest charges exceeding the returns obtainable on land investments. Those who supply mortgage-investment money may see in the present relationship of land values to current and prospective earning power a promise of an increased margin of safety. Purchasers will find their returns more adequate to meet their capital charges.

PROBLEMS AND REMEDIES

Farm Relief.—This review, favorable in the main, should not be taken to mean that our agricultural difficulties are over. Agricultural grievances of a substantial character persist, the remedy for which should not be left wholly to the free play of economic forces. The nation must accept its share of responsibility for seeking and applying sound and adequate relief. For the prosperity of agriculture a combination of individual efficiency, coöperative enterprise, and wise public policy is required.

Government Aid Needed.—Many of the fundamental principles that make for success in industry and trade can be applied to agriculture. Waste in production and distribution must be reduced. Markets must be expanded. New uses must be found for agricultural products. Producers must be organized for greater bargaining power, and Government aid should be invoked in research and in the maintenance or creation of favorable market conditions. Government aid to agriculture, particularly in the collection of economic information as a basis for planning production, is an increasingly indispensable agency in agricultural improvement.

AGRICULTURAL LEGISLATION

By Nelson Antrim Crawford

Director of Information, Department of Agriculture

AGRICULTURAL RESEARCH

Congressional Appropriations.—The most important agricultural legislation enacted by the Seventieth Congress of the United States at its first session is found in the acts pro-

viding for more thorough and extensive research into agricultural problems by governmental agencies. This Congress made by far the largest appropriations for scientific investigation that have ever been made by any legislative body in the world. The increase in research funds provided to the Department of Agriculture by Congress for the fiscal year ending June 30, 1929, amount to $1,800,000, an advance of about 16 per cent over the previous year.

Marketing.—The research program of the Department of Agriculture has in late years been expanded to cover effectively not only production but also marketing, the discovery of new uses for farm products, home economics, and rural life. In addition $480,000 was appropriated for payments to the states for experiments under the Purnell Act of 1925. Under this measure the state agricultural experiment stations have been stimulated to inaugurate and develop studies in marketing and other phases of agricultural economics and in home economics.

FORESTRY RESEARCH

McNary-McSweeney Act. — Congress also enacted the McNary-McSweeney forestry research act, which authorizes appropriations for research in all phases of forestry, including reforestation, the production of timber, the utilization of forest products, the prevention of erosion, and forest economics. This act also authorizes the Secretary of Agriculture to maintain forest experiment stations in sixteen regions: Northeastern station, for New England, New York, and adjacent states; Allegheny station, for Pennsylvania, New Jersey, Delaware, Maryland, and neighboring states; Appalachian station, for the southern Appalachian Mountains and adjacent forest regions; Southern station, for the southern states; Central States station, for Ohio, Indiana, Illinois, Kentucky, Missouri, Iowa, and adjacent states; Lake States station, for the Lake States and adjoining states; California station, for California and for adjoining states; Northern Rocky Mountain station, for Idaho, Montana, and adjoining states; Northwestern station, for Washington, Oregon, and adjoining states, and for Alaska; Rocky Mountain station, for Colorado, Wyoming, Nebraska, South Dakota, and adjacent states; Southwestern station, for Arizona, New Mexico, and adjacent states; a station for the Intermountain region of Utah and adjoining states; a station for Alaska; a station for Hawaii; a station for the tropical possessions of the United States and West Indies; and an additional station for the southern states. It is contemplated that the research provided for shall cover a period of ten years.

GENERAL LEGISLATION

Plant Quarantine Administration.—In line with the plan of Secretary W. M. Jardine to segregate research and regulatory work in the Department of Agriculture and to centralize the latter, Congress abolished the Federal Horticultural Board, turning its functions over to the Plant Quarantine and Control Administration. The chief of the new organization serves as chairman of an advisory Federal Plant Quarantine Board of five members.

Cotton Predictions.—Congress took action to prevent the Department of Agriculture or any of its officials from making any predictions as to future prices of cotton or their trend. This action was caused by a comment as to cotton prices in a report issued by the Department. The futures market in the product subsequently suffered a considerable drop and this was attributed to the comment referred to. Congress also barred the expenditure of funds for reports stating the intention of farmers as to the acreage to be planted in cotton or for mid-monthly reports on cotton estimates in July, August and November. This leaves the cotton reports of the Department of Agriculture to be issued on the eighth working day of each month.

Income Tax Exemptions.—The income tax law passed by the 70th Congress exempts from the tax on corporations, agricultural organizations

horticultural organizations, farmers' or other mutual hail, cyclone, casualty, or fire insurance companies or associations; farmers', fruit growers, or like associations organized and operated on a coöperative basis; and Federal land banks, national farm loan associations, and Federal intermediate credit banks. Various other exceptions are made in the law, but these are the ones of specific interest to agriculture. Provision was also made whereby Federal reserve banks may discount or purchase bills of exchange which grow out of the domestic shipment or the exportation of non-perishable, readily marketable agricultural and other staples.

FARM RELIEF

McNary-Haugen Bill.—As in every session of Congress since the beginning of the agricultural depression, various plans were proposed for farm relief. Attention was centered on the so-called McNary-Haugen Bill, known officially as the Surplus Control Bill. Bills similar to this and introduced by the same authors had been before previous Congresses, and one of them had been passed by the 69th Congress but vetoed by President Coolidge. The bill introduced into the 70th Congress provided for a Federal Farm Board with commodity advisory councils. The Board was to be authorized to make loans to coöperative associations or corporations created and controlled by coöperative associations. The plan, thus far, largely followed the recommendations of Secretary W. M. Jardine. In addition, however, the bill provided, as previous McNary-Haugen bills had also done, for an equalization fee, to be collected on the sales of products of which the farm board should find a surplus to exist. It was contemplated that the surplus would be disposed of abroad at a loss, to be covered by the fee, but that domestic prices would rise to such an extent as to pay a satisfactory return to the producers.

President's Veto Comment.—The bill passed the Senate April 12, 1928, by a vote of 53 yeas to 23 nays. On the bill passed by the 69th Congress the Senate vote was 47 to 39. The House of Representatives passed the bill on May 3, 1928, by a vote of 204 to 121, as compared with a vote of 214 at 178 on the bill in the 69th Congress. On May 23, President Coolidge vetoed the bill on the ground that it involved a price fixing policy, that the equalization fee involved a relinquishment of the taxing power of Congress, that the bill would set up a widespread bureaucracy, that it would encourage profiteering and wasteful distribution by middlemen, that it would stimulate overproduction, and that it would aid foreign agricultural competitors of the United States. In his veto message President Coolidge expressed the conviction that "the only sound basis for further Federal Government action in behalf of agriculture would be to encourage its adequate organization to assist in building up marketing agencies and facilities in the control of the farmers themselves." He also advocated a strong protective tariff on farm products. The President attached to his veto message an opinion of the Attorney General John G. Sargent that the act, if approved, would be unconstitutional. On May 25 an attempt was made to pass the bill in the Senate over the President's veto. It failed, there being 50 votes in favor of repassing the bill, and 31 against it, whereas a two-thirds vote was necessary. No further attempt was made to enact farm relief legislation.

GRAIN AND COTTON CROPS

By W. F. Callander

Chairman, Crop Reporting Board, Department of Agriculture

Production and Estimates Increase.—The crop year of 1928 shows an increase of 8 per cent over 1927 in the combined production of

grain crops (in bushels) in the United States, while the gross value based on December 1 farm prices increased about 2 per cent according to the December estimates of the Crop Reporting Board of the Department of Agriculture, issued December 14. The 1928 production was about 10 per cent above the five-year average from 1922-26.

COTTON

Value and Production.—An increase in cotton production of 11 per cent was accompanied by an increase of 3 per cent in the value of cotton lint and cottonseed on the basis of December 1 farm prices. The combined value of cotton and grain crops for 1928 on the basis of December 1 farm prices was approximately $5,536,000,000 or about 2 per cent more than for 1927 when the combined value was about $5,410,000,000.

Ginnings and Total Crop.—The total estimated ginnings from this year's cotton crop was placed at 14,373,000 bales by the Crop Reporting Board in its report issued December 8.

GRAIN AND COTTON CROPS IN THE U. S.

(Million bushels)

Crops	1928	1927	Five-year Average 1922-1926
Corn [a]	2,840	2,763	2,776
All Wheat	903	878	807
Winter wheat	579	553	556
Durum Wheat [b]	93	79	62
Other Spring	231	247	190
Oats	1,450	1,183	1,352
Barley	357	266	192
Grain Sorghums	143	137	115
Rye	42	58	64
Rice	42	45	37
Flaxseed	19	26	20
Buckwheat	13	16	14
Cotton lint (1,000 bales)	14,373	12,955	13,521
Cottonseed (1,000 tons)	6,390	5,759	6,004

[a] Includes corn for all purposes, including that hogged off, cut for silage, and forage as well as that husked and snapped for grain; the yield per acre represents a grain equivalent applied to all corn and in some states is less than the yield for grain.

[b] Four States—North Dakota, South Dakota, Minnesota and Montana only.

This is about 1½ per cent above the November 1 estimate and 2½ per cent above the October estimate, ½ of 1 per cent below the September forecast and about ½ of 1 per cent above the August 1 forecast. If the final ginnings bear out the December 1 estimate, the total crop this year will be about 1,400,000 bales or 11 per cent larger than last year but about 3,600,000 bales less than the large crop of 1926. The total ginnings of cotton to December 1 this year amounted to a little over 12,500,000 bales which indicates that there is still about 1,800,000 bales yet to be ginned, much of which will come from northwest Texas, Oklahoma and Arkansas.

Cotton Acreage.—The Mississippi River states showed a marked increase in cotton acreage in 1928. Part of this increase was due to the flood conditions which existed in 1927. The acreage increase of 29 per cent in Louisiana was the largest for any of the important cotton states. The acreage of Mississippi was increased 20 per cent, Arkansas 18 per cent, Missouri 20 per cent. There was an increase of 18 per cent in Oklahoma, 14 per cent in Alabama, 10 per cent in Texas, 13 per cent in Tennessee, 9 per cent in Georgia and North Carolina, no change in South Carolina and large acreage increases in the minor cotton states of Virginia, New Mexico, Arizona and California.

Production by States.—The total increase in cotton acreage was approximately 13 per cent for the United States while the yield per acre was estimated at 151.8 pounds per acre in 1928 as compared with 154.5 pounds in 1927 and a 10-year average of 156.3 pounds. The production of cotton in the more important cotton-producing states for 1928 and 1927 was as follows: Texas, 5,150,000 bales in 1928 and 4,352,000 bales in 1927; Mississippi, 1,470,000 bales in 1928 and 1,355,000 bales in 1927; Alabama, 1,090,000 bales in 1928 and 1,191,000 bales in 1927; Georgia, 1,020,000 bales in 1928 and 1,100,000 bales in 1927; Arkansas, 1,215,000 bales in 1928 and 1,000,000 bales in 1927. An increase of about

11 per cent in cotton production was accompanied by an increase of slightly less than 3 per cent in the December 1 value of cotton and cottonseed.

WHEAT

Acreage and Yield.—The 1928 wheat crop of 903,000,000 bushels was 3 per cent larger than the 1927 crop of 878,000,000 bushels and nearly 12 per cent larger than the five-year 1922-26 average production. The acreage of all wheat was 57,724,000 acres as compared with 58,784,000 in 1927. The average yield, 15.6 bushels per acre for all wheat, was slightly higher than the 1927 yield of 14.9 bushels. The average farm price of all wheat on December 1 was 97.2 cents as compared with 111.5 cents a year ago. The larger crop of 1928 was worth $877,000,000 on the basis of the lower December 1 prices as compared with $980,000,000 for the 1928 crop and $996,000,000 for the 1926 crop.

Winter Wheat.—Because of the heavy abandonment of winter wheat in the eastern corn belt states, the acreage of winter wheat in 1928 was only 36,179,000 acres as compared with 37,723,000 acres harvested in 1927. The yield per acre of 16.0 bushels was materially higher than the 1927 yield of 14.7 bushels. The increase in yield per acre was more than sufficient to offset the decrease in acreage and, as a result, approximately 579,000,000 bushels of winter wheat were produced in 1928 as compared with 553,000,000 in 1927, an increase of over 4 per cent.. The December 1, 1928 farm price of winter wheat of 103.6 cents was 11 per cent less than the December price of a year ago of 116.7 cents and was lower than the 1926 price of 121.2 cents.

Durum Wheat.—The production of durum wheat in the four important producing states continued to increase from 1927 to 1928 and approximately 93,000,000 bushels were produced as compared with 79,000,000 in 1927. This is an increase of about 17 per cent, while acreage increased about 22 per cent, from 5,484,000 in 1927 to 6,711,000 in 1928. The yield per acre of 13.8 bushels, in 1928, was somewhat lower than the 1927 yield of 14.4 bushels. North Dakota produced 79 per cent of this year's crop. The December 1 farm price of durum wheat of only 71.9 cents per bushel is much lower than a year ago when the price was approximately $1.00 per bushel.

Other Spring Wheat.—The production of spring wheat other than durum was estimated at 231,000,000 bushels in 1928, compared with 247,000,000 bushels in 1927, a decrease of about 6 per cent. The five-year 1922-1926 average production was 190,000,000 bushels. The decrease in production of other spring wheat was caused primarily by a decrease in acreage from 15,577,000 in 1927 to 14,834,000 in 1928, a decrease of nearly 5 per cent, while the yield per acre decreased slightly from 15.8 bushels per acre to 15.6 bushels in 1928.

CORN

Crop Conditions.—The spring months in all parts of the corn belt, where two-thirds of the crop is usually grown, were especially favorable for corn this season. This was not true in the Southern States, however. Wet, cool weather in the corn belt the latter part of June delayed the crop and discouraged the farmers. It was when the corn crop looked as if it would be taken by the grass and weeds that the weather cleared early in July and farmers were able to cultivate their fields. The clear, dry weather of early July made it possible to lay the corn by in excellent shape over practically the entire corn belt. Conditions in the Southern States, however, continued too cool and wet for the best corn development. During August favorable growing weather continued over most of the corn belt with the exception of Nebraska and South Dakota where severe drouth seriously damaged the crop. Tropical storms and continued wet weather held the condition low in southern states east of the Mississippi River. The dry weather of September hastened the maturing of the

crop to such an extent that the early frosts of late September, which occurred in the more northern parts of the belt, did little damage. As a result, the 1928 corn crop is of good quality throughout the corn belt states.

Production.—While there was an increase of nearly 3 per cent in corn production for the country as a whole, the geographic distribution of this year's crop is much more nearly normal than with the 1927 crop. The eastern corn belt states showed a much larger production of corn this year than last, while there was a marked reduction in the cotton states. The December 1 price of corn tends to reflect the changes in production to a considerable extent in most states as prices were slightly lower than a year ago in Ohio, Illinois, Michigan, Wisconsin, Minnesota, Iowa, Missouri and North Dakota, but higher in South Dakota, Nebraska, Kansas and all southern and eastern states.

The total production of corn in 1928 was approximately 2,840,000 bushels as compared with 2,763,000 bushels in 1927 and 2,776,000 bushels for the five-year average from 1922-1926. The corn belt states east of the Mississippi River showed an increase in crop production of about 34 per cent. About 808,000,000 bushels of corn were produced in this area in 1928 as compared with 603,000,000 bushels in 1927. The acreage in this area showed an increase of 9 per cent over the 1927 acreage. The production at 1,311,000,000 bushels in the north central states west of the Mississippi River was practically the same as last year. The acreage increased 3 per cent in this area but yields were slightly lower than in 1927. In the 11 important cotton states, the production of corn decreased about 20 per cent, from 551,000,000 bushels in 1927 to 439,000,000 bushels in 1928. Both acreage and yields were lower in these states than in 1927.

Carry-Over.—The carry-over of old corn on farms, as estimated November 1, was approximately 54,000,000 bushels as compared with 113,000,000 bushels a year ago. The carry-over of old corn this fall was one of the lowest on record. The reduced carry-over in bushels is practically equal to the increased production of the 1928 crop. As a result, the total farm supply of corn is practically the same as a year ago.

Price and Quality.—Although the production of corn is slightly above a year ago, the December 1 farm price of 75.1 cents was higher than the 1927 December 1 price of 72.3 cents. The quality of the 1928 crop was much better than either the 1927 or 1926 crop. About 83 per cent of the 1928 crop was reported as of merchantable quality as compared with 75 per cent a year ago and 73 per cent in 1926. The 10-year average is about 81 per cent.

OATS AND BARLEY

Production.—Although there was a slight decrease in acreage this year, the production of oats was 22 per cent above last year and 7 per cent above the 5-year average 1922-26 production. The yield per acre of 34.7 bushels was materially higher than last year's yield of 28.2 bushels. The average price paid to growers for oats on December 1 was reported as 40.9 cents per bushel compared with 45 cents on December 1, 1927. The total farm value of the 1928 oat crop was approximately $593,000,000 or $61,000,000 higher than last year's value of $532,000,000.

The production of barley continued to expand in 1928 primarily through acreage which increased from 9,476,000 acres in 1927 to 12,539,000 acres in 1928. The production of barley this year was about 357,000,000 bushels, an increase of 91,000,000 bushels above the harvested production of 266,000,000 bushels in 1927. This phenomenal increase in barley acreage and production due to its increasing popularity as a feed crop has occurred mainly in the north central states. The average farm price per bushel on December 1 declined from 67.8 cents in 1927 to 55.2 cents in 1928, but due to the larger crop the total farm value based on the December 1 farm price this year was

$197,000,000 or $17,000,000 in excess of last year's farm value of $180,000,00.

GRAIN SORGHUMS

Production of grain sorghums for all purposes, computed in terms of equivalent bushels, was estimated as 143,00,000 bushels compared with 137,000,000 bushels produced in 1927, and 115,000,000 bushels,—the average for the preceding five years. In states where production has increased, the December 1 price showed a decrease compared with last year, and states of decreased production show increased prices, the net result being a slight increase in the United States average price on December 1. Farm value based on December 1 prices for grain was about $88,000,000 in 1928 compared with $85,000,000 in 1927.

OTHER GRAINS

Rye.—Rye production in 1928 of about 42,000,000 bushels showed a decrease of about 28 per cent from last year's production of 58,000,000 bushels, and an average of 64,000,000 bushels for the preceding five years. Decreases in both acreage and yield per acre account for this decline. Rye acreage decreased from 3,648,000 acres in 1927 to 3,444,000 acres in 1928, while the yield per acre dropped from 15.9 bushels per acre in 1927 to 12.1 bushels in 1928. Farm value based on the slightly improved December 1 prices received this year is placed at $36,000,000 compared with $50,000,000 in 1927.

Rice.—Rice production for the United States was estimated at about 42,000,000 bushels compared with the revised estimate of 45,000,000 bushels last year, and 37,000,000 bushels the preceding five-year average. The crop in the southern states was about 34,000,000 bushels compared with 36,000,000 bushels last year. The California crop of about 8,000,000 bushels also showed less than a year ago. Both the acreage and yield per acre were lower in 1928 than a year ago. The December 1 price of rice was reported as 88.5 cents this year and 92.9 cents last year. The total value of the 1928 crop on this basis was $37,000,000 as compared with $42,000,000 last year.

Flaxseed.—Both the acreage and yield per acre of flaxseed were lower in 1928 than 1927, but the December price was higher than a year ago. This year's production was approximately 73 per cent of the 1927 crop or about 19,000,000 bushels in 1928 as compared with 26,000,000 bushels in 1927. The December 1 price of 201.1 cents in 1928 and 186.0 in 1927 has resulted in a total value for the crop of $39,000,000 in 1928 and $48,000,000 in 1927.

Buckwheat.—The production of buckwheat in 1928 of about 13,000,000 bushels was a decrease of 19 per cent from last year's crop of about 16,000,000 bushels. The acreage in 1928 was 750,000 acres and 810,000 acres in 1927. The yield per acre was 17.6 bushels in 1928 and 19.5 bushels in 1927. The December 1 price of 87.6 cents per bushel was slightly higher than the price of 83.5 cents per bushel a year ago. The total value was about $12,000,000 in 1928 compared with $13,000,000 in 1927.

FARM PRICES OF GRAINS

Index Numbers.—The monthly index number of farm prices of grains for November 15, 1928 was 110 per cent of the pre-war average (August, 1909 to July, 1914), of 100 per cent as compared with 120 per cent for November, 1927. This is a decrease of 10 per cent since a year ago. The index number of grain prices increased from 120 for November a year ago to a high point of 160 in May. The changes in this index are indicated by the following index numbers by months for the past year: November, 1927—120; December, 1927—123; January, 1928—125; February, 1928—128; March, 1928—136; April, 1928—144; May, 1928—160; June, 1928—152; July, 1928—142; August, 1928—120; September, 1928—117; October, 1928—116; and November, 1928—110. During the year price changes in corn, oats, barley, wheat and rye have followed rather closely the changes shown by the index number as a whole. Flaxseed prices failed to make the gains dur-

ing the late spring months that were made by the other grain crops.

Corn and Other Grains.—Corn prices remained at 159 or 160 per cent of pre-war level during May, June and July. Oat prices reached their high level of 155 and 154 during May and June, and since declined to as low as 92 per cent in September, with 100 per cent for the month of November.

Barley prices reached their high point of 137 per cent in May, 1928, and have been below 90 per cent during the last three months. Wheat prices also reached their high point for the season in May, 1928, and have since declined to around 110 per cent of their pre-war level. Rye prices reached their high point in May and declined later to 114 per cent in September and November 15 were 120 per cent of pre-war. Flaxseed prices reached their high point of 124 per cent in May and June, and in November were 117 per cent of the pre-war level.

Cotton.—The farm price of cotton continued at relatively high levels during the spring and summer months of 1928, reaching a low point in September of 142 per cent, increasing in October to 146 per cent and showing 144 per cent for November, 1928. The high point of 169 per cent was reached in July. The farm price of cottonseed reached the high point of 195 per cent of pre-war levels in May, subsequently declined to 141 per cent in September and on November 15 was 169 per cent of pre-war level.

LIVESTOCK AND MEAT PRODUCTS

By E. W. Sheets

Chief, Animal Husbandry Division, Department of Agriculture

THE CATTLE INDUSTRY

Prosperity.—The prosperous condition of the cattle industry is perhaps the outstanding feature of the Nation's agriculture in 1928. The year ends with abundant crops at comparatively low prices and with livestock as a whole at unusually high values. Our farm animals seem leading the way toward better times. The trend of beef cattle prices has been sharply upward since late in 1926. From the standpoint of purchasing power, cattle are probably in the best price situation in the 50 years for which records are available.

Range conditions, while in some sections not equal to those of a year ago when they were unusually good, cannot be considered unfavorable, and abundant supplies of roughage, corn, and other grains are in prospect for fattening cattle for market next year.

Stock Feeding.—There has been a considerable revival of stock-feeding operations in the central grain regions. The early movement of feeder cattle was very heavy; during the three months, July to September, nearly a half more cattle than last year moved into the Corn Belt through public stockyards, and feeders paid over a third more for them.

FARM ANIMALS

Likewise, during these same three months, shipments of feeder lambs into the Corn Belt, through public markets, were 17 per cent larger than last year, and exceeded any other like period except in 1926.

The total number of eggs laid by farm flocks has run about 3 per cent less than last year, with fewer laying hens and pullets on farms. However, there are still somewhat more fowls and more eggs than there were in either 1926 or 1925. The turkey crop, on the other hand, is slightly larger than last year, particularly in the West where a large share of the holiday turkeys are produced.

INCREASE

Recent studies show conclusively that farm animals in the United States are making noteworthy progress in increased efficiency. Agricul-

tural production as a whole was over 14 per cent greater in the period 1922-1926 than in the period 1917-1921, whereas population increased less than 9 per cent between the mid-years of these two 5-year periods; in other words, the increase of agricultural production was over 50 per cent greater than the increase of population. About two-thirds of this increase in agricultural production is assignable to the increase of animal products.

This increase in animal products has taken place with fewer animals of most kinds in the country. Marketing at younger ages is partly responsible. A shift by farmers in certain sections of the country from one class of animals to more productive species has also aided. It appears, however, that there has been an actual increase of 7 per cent in the efficiency with which farm animals convert feed into meat and other products during the two 5-year periods mentioned above. This is a most significant development, and a remarkable tribute to methods of breeding, feeding and management being employed by American stockmen.

MEAT PRODUCTS

Price Situation.—There is considerable feeling among consumers that they are paying dearly for their meat, particularly beef and veal. This is inevitable. For six years, beginning in 1920, the beef cattle industry was flat on its back, with western cattlemen going bankrupt on all sides and their stock almost without market value. The industry liquidated its surplus and reduced its breeding herds. A period of cattle scarcity and high prices was bound to follow. It is now with us. Cattlemen will enlarge their herds and are now beginning to do so, but a profitable price for beef is the only incentive worth following.

Meat Quality.—Consideration also should be given to the fact that these higher prices are being paid for meat of higher quality. The producer is meeting the consumer's own specifications. Younger, lighter-weight animals, packed with quality, are the kind being asked for. The stockmen have the proper quality of breeding stock and the feeds and feeding knowledge to produce a quality product. But the cost is greater. A fat yearling steer today has not in many cases been allowed to lose his milk fat. He has been crowded with corn and clover and mother's milk from the start. Such cheap feeds as straw and stover have no place in this young, super-quality beef being demanded by housewives today. Yet these feeds constituted an excellent means of cutting the corners of production costs by the stockmen of a few years back who fattened three- and four-year-old cattle upon a ration containing a large percentage of roughage.

Research.—The problem now is to find ways of producing quality beef with a maximum use of grass and roughage. Twenty state experiment stations, the Institute of American Meat Packers, the National Live Stock and Meat Board and the U. S. Department of Agriculture are coöperating in a national research project which aims to solve this and kindred problems. Lamb, pork and veal as well as beef are being studied.

Feeding Experiments.—During the past year 850 head of experimental cattle were fed in accordance with a standard plan of work. Ninety-seven of these were shipped to the Department's laboratory at Beltsville, Md., for detailed study of physiological, chemical and histological nature. Cooking tests and palatability gradings were performed on this meat, as well as on 290 beef ribs and 540 lamb carcasses shipped in from state and Federal stations throughout the country.

It is anticipated that it will be necessary to develop pure strains of our meat animals which will be homozygous to the extent that if a peculiar muscle structure, or arrangement of connective tissue or marbling of fat are found in one animal, another animal of the same breeding can be depended upon to have had these same characteristics present before a certain system of feeding or environment began to make itself felt. The ultimate goal of these coöperative efforts is a standardized product of uniform

high quality for the meat industry of the nation.

POULTRY INDUSTRY

A development in the poultry industry of quite a different nature, but with the same final goal in view, has been the development during the past year of uniform terminology in the various plans of state poultry improvement work throughout the country. The primary purpose of the plan is to identify authoritatively poultry-breeding stock, hatching eggs, and chicks with respect to quality by describing them, when offering them for sale, in terms uniformly accepted in all parts of the country. Protection is thereby afforded producers from unscrupulous competition, and purchasers will be able to buy with confidence. The uniform adoption of the plan should make poultry production more efficient and improve the quality of hatching eggs, baby chicks, breeding stock and market products.

DAIRYING

By Amer B. Nystrom

Senior Dairy Husbandman, U. S. Bureau of Dairy Industry

PROGRESS AND RESEARCH

Industry Holds Its Own.—The dairy industry of the United States has held its own during 1928. No general expansion has taken place during the year. Some sections of the South and West have shown an increase in production, but this has been offset by a decrease in other sections. The reason for this shift seems to be that as the demand for fluid milk for the market milk trade increases in the sections of greatest population, the prices for milk become too high for creameries, cheese factories, and condensories operating in those sections. They are therefore forced to move to districts where the prices are lower.

Fundamental Problems.—At nearly all the state agricultural experimental stations where dairying is of considerable importance, as well as at the Federal stations, more attention has been given during the past year to fundamental dairy research. The problems attacked are varied, including those relating to dairy cattle-breeding, proper dairy cow-nutrition, and the economical production of dairy products and by-products. Although a large number of these problems require many years for their solution, reports on some of them have already been made in technical bulletins and papers of the respective stations or in technical journals.

DAIRY PRODUCTS

Fluid Milk.—Statistics on fluid milk consumption for 1927 are not available, but indications are that the per capita consumption was slightly higher for 1927 than for 1926, when it was 55.3 gallons.

Butter.—The production of creamery butter in 1927 was 1,496,495,000 pounds in comparison with 1,451,766,000 pounds in 1926. This represents a gain of about 45 million pounds, or 3 per cent. Minnesota, Iowa, and Wisconsin, in the order named, remained the most important butter-producing states. Butter production in Minnesota and Wisconsin, however, failed to equal that of 1926, whereas in Iowa there was a substantial increase. In general, increases are reported in the less important butter-producing states, particularly those of the south, northwest and far west. The net imports of butter in 1927 were 4,118,533 pounds as compared with 2,546,075 pounds in 1926, an increase of about 1,500,000 pounds. This indicates a greater consumption of creamery butter, due probably to the increase in population and to a shift from farm butter to creamery butter production rather than to a greater per capita consumption. The per capita consumption of butter in 1927 was 17.62 pounds.

Cheese.—The production of cheese in 1927 was 406,686,000 pounds in comparison with 431,416,000 pounds

in 1926, a decrease of about 25,000,000 pounds, or 6 per cent. The net imports of cheese in 1927 were 76,385,773 pounds as compared with 74,514,226 pounds in 1926, an increase of nearly 2,000,000 pounds. These figures indicate a net reduction of about 23,000,000 pounds of cheese consumed in 1927 as compared with 1926. The per capita consumption of cheese in 1927 was 4.14 pounds.

Condensed and Evaporated Milk.—The production of condensed and evaporated milk in 1927 was 1,855,722,000 pounds as compared with 1,733,504,000 pounds in 1926. This represents a gain of about 122,000,000 pounds, or 6 per cent. The net exports were 112,885,000 pounds in 1926 and 95,778,000 pounds in 1927, showing a decrease of about 17,000,000 pounds. The per capita consumption of condensed and evaporated milk in 1927 was 14.23 pounds.

Ice Cream.—The production of ice cream was 335,703,000 gallons in 1927 and 324,665,000 gallons in 1926, a gain of about 11,000,000 gallons, or 3 per cent. The per capita consumption of ice cream in 1927 was 2.85 pounds.

Dry Milk.—Such products as dry milk, concentrated sour skim milk and buttermilk, and dried casein, showed substantial increases in production in 1927 over that in 1926. This is especially true of dry skim milk with an increase of 20 per cent.

MILK PRODUCTION

Imports.—Authorities agree that the demand for dairy products is growing slightly more rapidly than production, yet the production of milk for all purposes just about kept pace with demand. The United States is now importing dairy products to the extent of only 2.7 days' requirements for milk. The figures given above indicate net imports of butter and cheese and net exports of condensed and evaporated milk. Reducing these figures to milk equivalents gives a net import of 610,900,368 pounds of milk in 1927 as compared with 506,795,832 pounds in 1926.

Cow Statistics.—The number of dairy cows was slightly less in 1927 than in 1926, being 21,818,000 in 1927 and 22,188,000 in 1926. On the other hand the average production per cow increased from 4500 pounds in 1926 to 4600 pounds in 1927, making the total production of milk in 1927 practically the same as that in 1926. The increased production per cow is the result of more intelligent feeding, closer culling, and better breeding. The dairy-herd-improvement associations have played an important part in this increase. In 1927 there were 947 such associations, with 414,891 cows on test, averaging 7410 pounds of milk. In 1926, there were 837 associations, with 362,014 cows on test averaging 7316 pounds of milk. Here is an increase in one year of 100 pounds of milk per cow per year by the cows in dairy-herd-improvement associations.

DAIRY EXPOSITIONS AND CONGRESSES

Among the large expositions held primarily in the interest of the dairy industry are the following: The National Dairy Exposition, Memphis, Tenn., Oct. 13 to 20; Waterloo Dairy Congress, Waterloo, Iowa, Oct. 1 to 7; and Dairy Industries Exposition, Cleveland, Ohio, October 16 to 20.

The National Dairy Exposition is held each year under the management of the National Dairy Association. The main feature of this show is the dairy cattle exhibit. In 1928 cattle entries included 80 Ayrshires, 122 Brown Swiss, 156 Guernseys, 210 Holsteins, and 249 Jerseys. A complete line of farm dairy equipment was shown. One building was given over entirely to educational exhibits, which emphasized the importance of efficiency in production of our dairy cows and better quality in dairy products. St. Louis was selected by the association as the permanent home for the exposition. Plans were completed during the year for the erection of a complete set of buildings to house the 1929 exposition.

The Dairy Industries Exposition is sponsored by the Dairy and Ice Cream Machinery and Supplies Association. In size, the 1928 show exceeded that of 1927 by 15 per cent

and the attendance outnumbered that of the previous year by 10 per cent. The exposition included every conceivable article in the way of accessories, equipment, machinery, services and supplies for the dairy products industries.

The Waterloo Dairy Congress likewise surpassed any previous show in total attendance and number and quality of exhibits. The cattle exhibits included 90 Ayrshires, 98 Brown Swiss, 115 Guernseys, 205 Holsteins, and 90 Jerseys.

Pacific Expositions.—Two other dairy shows of special interest to the West Coast were the Pacific Slope Dairy Show held at Oakland, Calif., Nov. 19-24, and the Pacific International Livestock Show held at Portland, Oregon, Nov. 19-24.

The World's Dairy Congress was held in Great Britain June 26 to July 12. The United States sent 90 delegates representing 30 organizations including all lines of dairy activity. The delegation organized as follows: Honorary chairman, H. E. Van Norman, President American Dry Milk Institute; chairman, R. W. Dunlap, assistant secretary of agriculture; and secretary, A. M. Loomis, secretary American Dairy Federation. Ten of the delegates presented papers.

DISEASES AND PESTS OF ANIMALS

By John R. Mohler

Chief, Bureau of Animal Industry, Department of Agriculture

Control of Disease.—Continued progress in the control and eradication of animal diseases occurred during the year 1928. The United States also remained free from various foreign livestock maladies that take a heavy toll of losses in many other countries of the world. Of the more important infectious diseases affecting livestock in the United States, tuberculosis, hog cholera, and tick fever have been the objects of intensive campaigns of suppression and the extent of these maladies has declined accordingly.

Tuberculin Testing.—The campaign conducted by Federal, state, and local officials against tuberculosis resulted in a new high record for the volume of tuberculin testing, which is the method used to detect the disease. During the fiscal year ended June 30, 1928, veterinarians officially tested more than 11,000,000 cattle. A survey of the extent of bovine tuberculosis revealed an estimated prevalence of about 2 per cent in May, 1928, compared with 4 per cent in 1922. This decline signifies a material lessening of danger, from bovine tuberculosis, to the human race as well as to livestock. The year 1928 also witnessed the practical eradication of bovine tuberculosis from the entire State of North Carolina. Systematic tuberculin testing of the cattle throughout that State revealed that infection has been reduced to less than one-half of 1 per cent. Other states also are gradually winning freedom from the infection.

Hog Cholera.—Outbreaks of hog cholera reported from all sources during 1928 showed a noteworthy decline from those of the previous year. This disease is being kept under control by the extensive use of the preventive-serum treatment and by a corps of trained veterinarians who investigate outbreaks, supervise cleaning and disinfection of premises, and conduct educational work among swine owners and local veterinarians.

Tick Fever.—In the part of the south still under quarantine because of tick fever among cattle, the systematic dipping of cattle for the eradication of the disease resulted in the cleaning up of additional territory in six states. The release, December 1, 1928, of the last ticky territory in Oklahoma placed that state above the tick-quarantine line, making it the ninth state to eradicate cattle ticks.

Poultry Research.—Continued prog-

ress also occurred in the suppression of various other animal diseases and in knowledge concerning the best means of combating them. Poultry diseases are receiving considerably more study than heretofore owing to the increasing economic importance of the industry. Poultry raising has been hampered by many preventable losses, and research work is now in progress with the view of helping poultry owners to raise a larger proportion of their chicks as well as to reduce the mortality among mature fowls.

Livestock parasites also were the object of extensive technical research. A recent survey revealed more definitely than heretofore the cause and extent of losses from these livestock enemies in various parts of the country. Success in combating animal parasites depends not only on a knowledge of the proper treatment, but on its timely application.

Disease Control Factor in Stock Raising.—In view of keen present-day competition in business the effective control of diseases and pests which attack animals has become a dominant factor in stock raising. The reduction of preventable losses becomes imperative if the livestock industry is to prosper and if the consumers' demands for animal products at moderate prices are to be met at the same time. Thus the subject of livestock diseases is of practical interest not only to farmers and stockmen but to the public at large.

DISEASES OF PLANTS

By R. J. Haskell

Pathologist, Department of Agriculture

Cereal and Forage Crops.—The rust diseases of cereals were generally subnormal in prevalence. Black stem rust caused only a comparatively slight reduction in the wheat crop. On the other hand, scab was unusually destructive, especially to wheat and barley, and to some extent on oats, and foot rot diseases of wheat took a heavy toll from Minnesota westward to the Pacific Coast. Bunt of wheat continued to cause heavy losses in spite of considerable seed treatment. New bacterial diseases of corn, sorghum and kudzu were reported, and the stem nematode (*tylenchus dipsaci*) was recognized for the first time in this country on oats.

Field and Vegetable Crops.—Late blight and rot of potato was moderately destructive in parts of New England, West Virginia, Maryland and Wisconsin. The newly recognized potato disease, "psyllid yellows," continued to cause trouble in Utah in 1928 and was also found in Colorado, Idaho and California. Apical leaf roll is a newly described virus disease of potato. A new and menacing disease of onions, "yellow dwarf," became serious in the Pleasant Valley District of Iowa and prevalent in the southeastern onion district of Wisconsin. A bacterial disease of beans called "halo spot" was found destroying large acreages in Montana, Wyoming and Colorado. A new fusarium disease of beans was reported from California, a bacterial spot of radish and turnip from Indiana, and *verticillium* wilt of cotton from Tennessee.

Fruits.—The communicability of the phony peach disease, which has steadily been increasing in prevalence in Georgia, was established through the medium of root inoculation. Approximately 650,000 trees out of a total of some 15,000,000 in Georgia, were removed during the year on account of this disease. The bacterial spot of peach (*bacterium pruni*) has become an increasingly important problem each year and in 1928 it probably caused more damage than ever. A promising new zinc sulphate spray for its control has been devised by Roberts and Pierce of the Bureau of Plant Industry. A new summer spray for apples, calcium monosulphite, has also been reported by R. H. Hurt of Virginia.

Trees and Flowers.—The scab disease of willows, reported last year, was found to be more widely distributed in 1928 in New England, New York and eastern Canada. A new occurrence of European larch canker on Douglas fir was discovered in Rhode Island. Two severe cases of an infectious chlorosis of roses have been reported by White from New Jersey and Massachusetts. This disease has possibilities of becoming serious and should be guarded against until more is learned concerning it. Progress has been made in the control of aster yellows by screening beds with a wire or cloth netting, and in the control of aster wilt through the use of resistant varieties. Some of the new diseases described during the year were mosaic of gladiolus, white blight of sweet pea, snowberry anthracnose, a rot of gladiolus corms caused by penicillium, and a bacterial blight of lilac.

Plant Quarantines.—A quarantine prohibiting the interstate movement of Scotch pine and certain other hard pines, from nine counties of northern New York on account of the Woodgate rust, was announced effective Nov. 1. A public hearing to consider the advisability of quarantining the states of Georgia and Alabama on account of "phony" peach disease was held by the Federal Plant Quarantine and Control Administration, Dec. 17. This quarantine would control the distribution of nursery stock from infested areas in an effort to prevent spread to other peach districts. No action has been announced to date. The white pine blister rust quarantine (No. 63) was revised; (1) by adding the state of Idaho and four counties in Oregon to the territory designated as infested; and (2) by removing some of the restrictions relating to the interstate movement of five-leafed pines and Ribes.

INSECT PESTS

By J. A. Hyslop

Bureau of Entomology, Department of Agriculture

Grasshoppers and Crickets.—In the Tule Lake district of California and Oregon, grasshoppers were numerous enough to occasion extensive control campaigns. Less serious outbreaks occurred in Kansas and Nebraska. As a whole the year was not one of widespread depredations. In northwestern Colorado the mormon cricket (*anabrus simplex* Hald.) occurred in outbreak numbers and in northern Florida the lubber grasshopper (*brachystola magna* Gir.) was unusually numerous.

Alfalfa Weevil.—The alfalfa weevil (*phytonomus posticus* Gyll.) has been recently discovered in the following counties: Garfield County, Utah; Adams and Boise Counties, Idaho; Mesa and Garfield Counties, Colorado; Lincoln, Humboldt, and Elko Counties, Nevada; and Scotts Bluff County, Nebraska. The injury inflicted by the weevil has been serious in western Nevada, northern Utah, and central Colorado. No serious injury has been reported elsewhere.

Hessian Fly.—Early spring surveys indicated that the Hessian fly (*phytophaga destructor* Say) was seriously infesting wheat in the central and southern counties of Kansas and in parts of Oklahoma. Very serious injury to wheat in northwestern Virginia was also reported early in the season. Later, however, the situation became more favorable through most of the country and infestations in general were reported as slight or moderate except in parts of Ohio and Nebraska. The midsummer survey indicated that in southwestern Nebraska, central Kansas, and parts of Missouri, the fly could do considerable damage.

European Corn Borer. — During 1928 the European corn borer spread in the Great Lakes district to cover a territory from 10 to 30 miles in width contiguous with the territory

known to have been infested in 1927. The relative intensity of infestation in this region has not materially changed. In Rhode Island and southeastern Massachusetts a decided increase in infestation developed during 1928.

Japanese Beetle.—The Japanese beetle appears to have been less numerous than in previous years in the central part of the infested area, whereas the more recently infested areas have shown decided increases. During the season a rather heavy infestation was located at Springfield, Mass. The insect is now quite generally distributed over Delaware and northern and western Maryland, and was found at Alexandria, Va.

Oriental Fruit Moth.—Along the Atlantic seaboard the oriental fruit moth (*laspeyresia molesca* Busck) was less troublesome than the year before. In the Georgia fruit belt it emerged from hibernation later than in 1927. In the more recently infested areas of southern Indiana and Illinois it proved extremely destructive this year, practically all of the fruit having been infested at many localities.

Peach Borer.—Infestations of the peach borer (*ægeria exitiosa* Say) were apparently heavier than usual in the Georgia fruit belt. The moths emerged decidedly later than in 1927 in that district, and were collected on Oct. 11, whereas usually the last ones are seen on or before Oct. 1. The late emergence extended westward across southern Illinois.

Mexican Bean Beetle.—Although early indications were that the Mexican bean beetle (*epilachna corrupta* Muls.) would be subnormally abundant in the originally infested areas in Alabama because of low winter survival, subsequent conditions offset the winter loss. The first adults appeared in Alabama 13 days later than last year. Surveys made late in the season indicated that this insect has advanced eastward about two tiers of counties in western New York state over the known distribution of last year and has entered the southeastern part of the state in Orange and Rockland Counties. It is recorded for the first time this year from the greater part of New Jersey, Delaware, and Maryland. In North Carolina this insect has reached the coast and in Indiana it has reached the northeasternmost corner of the state and has crossed over into Branch and Ingham Counties, Mich. The extension of territory southward and westward has been negligible.

MARKETING

By A. W. McKay

Senior Agricultural Economist, Department of Agriculture

CROP ECONOMICS

Acreage and Yields.—From the standpoint of crop yields, 1928 was better than an average year. The acreage of the more important crops harvested showed small reductions from 1927, although about 3,500,000 more acres of corn were harvested in 1928 than last year. Estimates on November 1, however, place the combined yields of all crops 3.4 per cent above the average of the past 10 years. The condition of the fruit crop was generally excellent; production was greater than in 1927 and for most fruits above the average of the years 1922 to 1926. There was a record-breaking crop of potatoes, estimated on November 1 at over 465,000,000 bushels.

Prices for leading farm crops and livestock were extremely spotted. Wheat prices on November 1 were 10 to 20 cents per bushel below those prevailing on the corresponding date in 1927. Corn was higher than at this date last year, but considerably below the peak reached in May, 1928. The October price of New Orleans spot cotton was 2 cents per pound lower in 1928 than 1927, but later advances make prospects for the cot-

ton growers somewhat more favorable in 1928-29 than during the 1927-28 season. Hogs, apparently, are near the bottom of the price cycle, medium weight, choice hogs bringing only slightly over 9 cents per pound on the Chicago market November 1, while cattle prices are still high, ranging on the same date between 17 and 18 cents per pound for choice steers. Potato prices were disastrously low in all except the earliest sections. Onion and cabbage growers, on the other hand, experienced high prices and a brisk demand. Grape growers have been obliged to accept prices even lower than in 1927, while the prices of apples and citrus fruit, on the whole, have been satisfactory.

MARKETING DEVELOPMENTS

Legislative Outlook.—This brief review of the crop and price situation indicates the complexity of the agricultural marketing problem. It is, in fact, not one but a series of problems. The veto by President Coolidge of the revised McNary-Haugen Bill, which was passed by Congress early in 1928, ended for the time being attempts to relieve the farm situation by legislation. Other legislative proposals were taking form when the second session of the 70th Congress convened on December 3. It appeared impossible, however, that any farm relief legislation would be enacted during the year, and at least an open question whether such action would be taken before the adjournment of Congress on March 4, 1929.

Produce Clearing House Plans.—Fruit and vegetable growers and shippers in several regions continued their interest in "clearing-house" organizations during 1928. New organizations of this kind were set up for Florida citrus fruit and California deciduous fruit, and a similar organization is proposed for the marketing of potatoes in the Kaw Valley district of Kansas. These are in addition to some four or five formed in 1927. A clearing house usually is an organization of growers which adopts certain rules for the standardization and distribution of the product, and endeavors to enforce these rules through contracts with commercial shippers and coöperative associations marketing the product. The best that may be said for produce clearing houses is that they are still in the experimental stage. Although some local and temporary benefits evidently have been obtained, the experience of 1928 would not encourage optimism regarding the permanence of these organizations. Serious difficulties are met in attempting to unite in one organization growers and shippers whose interests are fundamentally different.

COOPERATIVE MARKETING

Coordination Supply and Demand.—More permanent and encouraging developments are to be found in the field of coöperative marketing. There is a prevalent belief that the most hopeful legislative approach to a solution of farm marketing problems is to assist in the further development of farmer-controlled marketing organizations. Whatever the outcome of the various farm relief proposals may be, it is now generally accepted that coöperative marketing associations are essential in the development of improved marketing practices. One fundamental reason for the continued development of coöperative marketing is that it offers, under present conditions, the most practical means of coordinating production and marketing.

Agricultural problems are largely production problems. If it were possible to obtain an adequate but not excessive supply of a product of desirable quality, which is graded and packed according to known standards, marketing would become a relatively simple process. It would then only be necessary to find the best outlets for the product and to keep marketing costs at a minimum. This could be done by any agency, whether coöperatively or privately owned, which handled a reasonably large volume of business and operated with moderate efficiency.

Value of Standardization.—These conditions, however, are seldom found in agriculture. Supply is seldom coordinated with demand in such a way that the resulting price is satisfactory

to both the producer and consumer. Farm products are not uniform in quality and, while progress has been made in standardization, it is necessarily difficult and slow. Consequently, marketing agencies are working under the handicaps of uncertain supplies and lack of uniformity in quality. Where these handicaps have been overcome, this has been accomplished practically without exception by cooperative organizations. There are several reasons why coöperatives generally are able to effect some degree of coördination between production and marketing. For example, unless a farmer is a member of the organization that markets his products, it is difficult for him to visualize the need of improvements which enhance or make more uniform the quality of his crops. Furthermore, under the cooperative system he usually receives market premiums for quality, while under a noncoöperative system he seldom receives such premiums. Hence the member of a coöperative has an economic motive for improving his production practices which other farmers do not have.

TRENDS IN COOPERATIVE MARKETING

Centralization.—Trends in the cooperative marketing of farm products during the past year have been distinctly toward greater centralization of selling, financing and allied functions. At the same time, there has been increased recognition of the necessity for strong local associations and the importance of clearer understanding on the part of farmers of the aims and accomplishments of cooperatives.

Cotton.—The state-wide cotton marketing associations which are members of the American Cotton Growers Exchange have recently taken steps to have all sales made by agencies and operated by the exchange, instead of by each association independently as heretofore. The American Cotton Growers' Exchange is also carrying on statistical research relative to price factors and trends which has proved of value to the associations and their sales representatives. Several associations are fostering community-owned cotton gins which, in addition to giving the grower improved service, usually at greatly reduced costs, serve as a local unit of the marketing association.

Grain.—State-wide wheat marketing associations in the United States have not attained the size and prominence of the Canadian organizations of the same type. During 1928, or earlier, many of these associations made changes in their marketing contracts which made them better adapted to the financial needs of their members. Closer working relationships also have been developed with country elevators which assure the associations improved local services in the receiving and shipping of grain. Local farmers' elevators, of which there are over 4,000 in the United States, are taking a more active interest than ever before in the formation of central marketing agencies. They are also successfully working out practical methods of paying their patrons market premiums for wheat of better than average milling quality.

Dairy Products.—Coöperative marketing of dairy products has advanced further than that of other farm products. Certain associations marketing milk have gone far in the development of effective methods of stabilizing production and prices. Local associations manufacturing butter and cheese have federated to form central selling agencies. The result has been more wide-spread standardization of these products and the development of distinct markets for high-grade butter and cheese sold under the trade-marks of producer-owned organizations. During 1928, the partial merger of two large coöperatives marketing butter gave evidence of the trend toward further centralization. This has been paralleled by mergers of large dairy companies which have continued during the past three or four years.

Fruits and Vegetables.—To some extent, the interest of growers of fruits and vegetables has been diverted to clearing house organizations to which reference has already been made. Nevertheless, associations mar-

keting these products are making consistent progress. A coöperative organization marketing California citrus fruit reports, for the year ended October 31, total sales of over $95,000,000, the largest business by over $10,000,000 ever reported by a cooperative organization in this country. Improved grading and packing, economical operation, the intensive use of advertising and other merchandizing aids and the manufacture of byproducts from undesirable grades are some of the principal accomplishments of large scale associations in this branch of agriculture.

Livestock.—Coöperative terminal-market agencies have been formed by livestock producers during the past ten years, and one or more of these agencies is now established in each of the important terminal livestock markets. During 1928, the value of their total sales was approximately $300,000,000. These associations have given the stockmen efficient selling service and have effected substantial reductions in terminal market costs. Livestock shipping associations, located at country points within a radius of 50 miles from terminal markets, are meeting increasingly severe competition from motor truck operators who assemble livestock and transport them by truck direct to the terminals. To meet this competition, the associations in these districts are considering the development of coöperative trucking operations.

COÖPERATIVE ASSOCIATIONS

National Organization.—Preliminary plans were made at the fourth annual session of the American Institute of Coöperation for the establishment of a national organization of all agricultural coöperative associations. This organization is designed to coördinate the marketing activities of coöperative associations and to represent them in dealing with legislative, educational, tariff or transportation questions. A special committee was engaged in developing and working out plans of organization late in 1928.

FISHERIES

By Lewis Radcliffe

Deputy Commissioner, U. S. Bureau of Fisheries

REGIONAL

The Industry.—According to the most recent statistics available, the fisheries of the various geographical sections of the United States and Alaska annually employ approximately 118,600 commercial fishermen, and 4,300 persons on transporting vessels directly connected with the fisheries. The annual landings of fishery products amount to nearly 2,500,000,000 pounds, valued at nearly $103,000,000 to the fisherman. During 1927 the fishery industries experienced a somewhat varied year with conditions being less favorable than in 1926.

Atlantic Packs.—On the Atlantic Coast the landings of fish at the principal New England ports were the largest on record. The largest pack of canned shrimp on record was produced in the South Atlantic and Gulf states, and there was an increased oyster pack over a year ago. On the other hand, the pack of sardines in Maine was 26 per cent smaller than the previous year, and the menhaden industry experienced its third poor year in the last four years, with an output only one-half as large as has been considered normal for recent years.

Pacific Packs.—On the Pacific Coast the pack of canned salmon was considerably curtailed in 1927, due to scarcity of fish. The California sardine pack continued to grow, being in 1927 six times as large as in 1921 when the production was at a low level. There was a gain in the production of canned tuna, which was due principally to larger packs of the striped and yellow fin varieties. The

catch of halibut increased slightly over 1926, in spite of the depleted condition of the fishery.

New England Vessel Fisheries.—Landings of fishery products by American fishing vessels at Boston and Gloucester, Mass., and Portland, Me., during 1927, were the largest on record, and amounted to nearly 264,000,000 pounds, valued at over $9,400,000. The most important species were—haddock, 128,500,000 pounds, valued at $3,500,000; cod, 61,400,000 pounds, valued at $2,100,000; mackerel, 31,400,000 pounds, valued at $1,300,000; swordfish, 2,300,000 pounds, valued at $500,000; flounders, 8,400,000 pounds, valued at $400,000. Compared with the landings for 1926 there was a considerable increase in both quantity and value for haddock and flounders; a decrease in quantity and an increase in value for swordfish; a decrease in both quantity and value for cod and mackerel.

Seattle.—Fishing vessels landed over 31,500,000 pounds of fishery products, valued at over $3,260,000, at Seattle during 1927. This is a decrease under the previous year of 3 per cent in amount and 9 per cent in value. Collecting vessels landed over 15,780,000 pounds of fishery products, valued at $1,250,000, all of which were taken in Puget Sound. This is a decrease of 17 per cent in amount and 26 per cent in value compared with 1926, and was due mainly to lesser quantities of salmon landed.

TYPES OF INDUSTRY

Frozen Fish.—The trade in frozen fishery products increased in 1927 over 1926. Among the important species frozen are halibut, salmons, lake trout, mackerel and whiting. The average monthly holdings amounted to about 49,000,000 pounds. About one-third of the fish frozen annually is produced in the Pacific Coast States; about one-third in the New England States; and the remainder in the other fishery sections of the United States.

Canned Fish.—The production of canned fish in 471 establishments in 1927 amounted to over 475,000,000 pounds, valued at over $81,000,000. This is a slight decrease in value compared with 1926, but is not due to a general slackening of the industry. Rather, it is due to a partial failure in the salmon industry, the value of whose products decreased 19 per cent compared with 1926. The production of other products, including California sardines, tuna, shrimp, clams and oysters, increased, varying between 19 and 58 per cent. The value of the production of Maine sardines decreased 22 per cent and was the only important canned fishery product besides salmon of which the value of the production was less than in 1926.

Fishery By-products.—The output of fishery by-products in 1927 was valued at about $12,800,000, which is an increase compared with the value for 1926. The by-products consisted of 13,700,000 gallons of fish oil, including whale, 92,000 tons of fish and whale scrap and meal and shrimp bran, 311,000 tons of shell products, and almost 3,000,000 pounds of miscellaneous by-products, including fish glue, herring skins and scales, isinglass, fish flour, and other items.

Packaged Fish.—The outstanding feature of the 1927 developments in our fisheries was the continued growth of the packaged fish trade. This method of preparing fish for market has opened new channels of distribution through its merit of being readily handled by retailers, and by the housewife. The growth of this branch of the industry is having an important effect on the complexion of our fisheries as indicated by the increased landings at New England ports of haddock, the variety most used in the filleted and packaged form. The increase amounted to 37 per cent as compared with 1926, and 84 per cent as compared with 1922, when this method of preparation for market was introduced.

FOREIGN TRADE

The foreign trade in fishery products of the United States during 1927 amounted to over $74,000,000, of which $55,000,000 represents the value of fishery products imported for con-

sumption, and $19,000,000 the value of exports of domestic fishery products. Compared with the previous year this is an increase of 6 per cent in total trade, an increase of 11 per cent in the value of fishery products imported for consumption, and a decrease of 8 per cent in the value of the exports of domestic fishery products.

STATISTICS FISHERIES OF UNITED STATES AND ALASKA BY SECTIONS

Sections	Fishermen	Fishing Vessels	Fishing Boats	Persons on Transporters	Transporting Vessels	Products	
						Pounds	Value
New England States, 1924	15,007	615	10,022	278	162	406,822,165	$ 18,818,132
Middle Atlantic States, 1926	9,953	617	4,489	107	63	168,012,495	12,456,256
Chesapeake Bay States, 1925	24,793	574	16,895	985	523	333,205,769	13,948,060
South Atlantic States, 1923	10,094	177	5,934	180	103	228,747,930	5,087,340
Gulf States, 1923	10,576	349	6,809	339	143	160,324,042	8,096,650
Pacific Coast States, 1926	18,597	703	7,129	475	172	521,286,418	18,914,733
Mississippi River States, 1922	12,310	...	15,538	30	13	105,733,734	4,503,521
Lake States, 1926	6,233	504	3,756	162	103	75,300,268	6,642,392
Alaska, 1927	11,030	504	6,781	1,773	481	470,022,050	14,434,630
Total various years, 1922-1927	118,593	4,043	77,353	4,329	1,763	2,469,454,871	$102,901,714

Note.—In the statistics for the Pacific Coast States in this table the number of transporters and persons on transporters are for 1922. For the Lake States all persons engaged, boats and vessels are for 1922.

FISHERIES CONSERVATION

The more general appreciation of the danger of complete depletion of many of the most important commercial fisheries has brought conservationists, fishery interests and legislators to the realization that the scientific control of our fisheries or the application of rational methods of fish husbandry is necessary to safeguard this resource of increasing importance to the nation. Fisheries research centered in the U. S. Bureau of Fisheries is aimed at—(1) determining the condition and trend of the great commercial fisheries in order to discover the early evidence of depletion; (2) recommending protective regulations based upon the biological requirements of species threatened by overfishing; and (3) developing scientific methods of water farming as applied to the shellfish industries and to the stocking of inland waters with game fish.

Excellent progress is being made in the studies of the great salmon fisheries of Alaska. The investigations have reached a stage which will permit the forecasting of the size of future years' runs with a considerable degree of accuracy, as was demonstrated in 1927 when the actual run in the Karluk River exceeded the predictions by less than 10 per cent. Similar predictions of the runs of Atlantic mackerel have met with corresponding success. Oyster culture is being placed on a firmer foundation by applying the results of scientific research to the business. Notable progress has also been made in the conquest of fish diseases which have seriously curtailed the output of the many fish hatcheries scattered throughout the country. These investigations in fish pathology and experimental fish culture have gone far to increase the effectiveness of hatcheries and may eventually place the farming of fish in ponds upon a successful and lucrative basis.

Alaska Fur Seals.—The Pribilof Island fur-seal herd which is under the jurisdiction of the Department of Commerce, Bureau of Fisheries, now

numbers about 870,000. There are killed annually about 30,000 seals. These are sold at public auction at St. Louis. At the sale held on May 14, 1928, 5995 black dyed, and 3987 logwood brown dyed skins, a total of 9982, were sold for government account at a gross price of $381,572.00. At the second sale held on October 15, 1928, there were sold 13,460 seal skins taken on the Pribilof Islands, and 162 Japanese seal skins received under treaty agreement, and 16 partly processed skins, the total amount received being $415,789.80. In addition, there were sold 278 blue and 15 white fox skins.

FISH PROPAGATION

Culture.—The fish-cultural operations of the U. S. Bureau of Fisheries during the year resulted in a production of fish and eggs exceeding all previous records. There were distributed to applicants or planted in public waters 7,036,317,000 eggs and fish of the 46 different species propagated, marine commercial species, including cod, haddock, pollock, and winter flounder comprising 82 per cent of this total. The commercial species of interior waters accounted for 8.3 per cent, and the commercial anadromous forms such as the shad and Pacific salmons amounted to 7 per cent. The strictly game forms represented two and seven-tenths per cent. The distribution of 261,634,200 fingerlings is a 37 per cent increase over the output of this class of fish for the previous year.

Salvage of Fish from Overflowed Areas.—On the Upper Mississippi River 145,176,900 fish were handled, of which less than 1 per cent were diverted away from parental waters. In addition to domestic distribution, 226,000 fish and eggs were forwarded to six foreign countries,—Costa Rica, Cuba, Equador, Germany, Peru, and Switzerland. The Bureau likewise allotted 104,348,000 eggs to the various states as a form of coöperation in their activities. The five fish cars utilized in distributing the output traveled a total of 112,533 miles during the year and detached messengers operating from the cars covered approximately 100,000 miles in addition.

The cooperative nursery system whereby fish are turned over to sportsmen's organizations for rearing to larger size rather than planted immediately in the streams has been further expanded. The number of units operating under this plan has been increased to 86, and 2,675,000 fish, mostly trout, were allotted. The feeding of these fish in rearing pools by sportsmen's organizations for a period of 4 to 5 months or longer has permitted the distribution of a large proportion of them at a size of 5 or 6 inches rather than as small fingerlings.

COGNATE SOCIETIES

AMERICAN FARM BUREAU FEDERATION.—58 E. Washington St., Chicago, Ill.

AMERICAN FISHERIES SOCIETY.—2273 Woolworth Bldg., New York, N. Y.

AMERICAN FORESTRY ASSOCIATION.—1523 L. St., N. W., Washington, D. C.

AMERICAN FORESTRY ASSOCIATION.—155 E. 42nd St., New York, N. Y.

AMERICAN GAME PROTECTIVE ASSOCIATION.—233 Broadway, New York, N. Y.

CROP PROTECTION INSTITUTE.—21st & B. Sts., N. W., Washington, D. C.

FARMERS' NATIONAL COUNCIL.—Bliss Building, 35 W. St., N. W., Washington, D. C.

FARM WOMEN'S NATIONAL CONGRESS.—Clarksville, Iowa.

INTERNATIONAL FARM CONGRESS OF AMERICA.—Continental Bldg., Kansas City, Mo.

INSTITUTE OF AMERICAN MEAT PACKERS.—34 Pine St., New York, N. Y.

JEWISH AGRICULTURAL SOCIETY, INC.—301 E. 14th St., New York, N. Y.

MIDDLE ATLANTIC·FISHERIES ASSOCIATION.—111 Cliff St., New York, N. Y.

NATIONAL AGRICULTURAL SOCIETY.—Hartford, Conn.

NATIONAL BOARD OF FARM ORGANIZATION.—1731 I. St., N. W., Washington, D. C.

NATIONAL COOPERATIVE MILK PRODUCERS' FEDERATION.—1731 I. St., N. W., Washington, D. C.

NATIONAL HIGHWAYS ASSOCIATION.—18 Old Slip, New York, N. Y.

NEW YORK PRODUCE EXCHANGE.—2 Broadway, New York, N. Y.

SOCIETY OF AMERICAN FLORISTS AND ORNAMENTAL HORTICULTURISTS.—247 Park Ave., New York, N. Y.

SOCIETY FOR THE PROMOTION OF AGRICULTURAL SCIENCE.—Department of Agriculture, Washington, D. C.

SOCIETY OF AMERICAN FORESTERS.—1523 L. St., N. W., Washington, D. C.

WOMAN'S NATIONAL FARM AND GARDEN ASSOCIATION.—26 E. 35th St., New York, N. Y.

WORLD AGRICULTURE SOCIETY.—Amherst, Mass.

DIVISION XII
MINERAL INDUSTRIES

MINING AND ORE DRESSING

By Charles E. Locke

Associate Professor, Massachusetts Institute of Technology

STATE OF MINERAL INDUSTRY

Shipments.—Notwithstanding 1928 was a year of presidential election, the mining industry has prospered on the whole. Taking iron ore shipments from the Lake Superior district as an index, the total shipments for the first ten months of the year was 49,465,000 long tons as compared with 49,106,000 tons for the corresponding period in 1927 and the estimate for the entire year is around 55,000,000 tons against a total of 52,343,000 tons for 1927.

Production.—Metal and mineral production continued to follow the general upward trend of past years, thus keeping in line with the increase in population and general growth in manufacturing. Pig iron showed an increase over 1927 and non-ferrous metals also made some gain over the average of the three years just preceding. One important point was that production of both iron and non-ferrous metals seemed to be more uniform in that the fluctuations from month to month were not as great as in past years.

Prices.—Considering the record to November first, metal prices, as averaged for each month, held fairly steady. Silver ranged from 57 to 60 cents per ounce. Copper rose from 13.8 cents per pound to 16 cents. Lead in New York had a limited range of 6 to 6.5 cents per pound. Zinc in St. Louis varied between 5.5 and 6.25 cents per pound. Tin had a general downward tendency from a high of 55.65 cents per pound to 47 cents. This metal was at the low figure in November due to increased supply and even at that figure there was a feeling that the price was being artificially sustained. Quicksilver held between $121.00 and $128.00 per flask of 76 pounds. Platinum had a high of $84.80 per ounce and a low of $78.00, being stabilized at the latter figure for the six months ending with October. Aluminum, the price of which is practically set by the manufacturers, remained stationary at 24.3 cents per pound. Basic pig iron held at $17.00 per long ton for the first four months of the year, dropped to a low of $15.56 for June and then rose to $16.71 for October. In the case of copper, lead, zinc, quicksilver and iron the tendency in November seemed to be for prices to go higher. One favorable factor in the metal situation is the increasing demand from Europe as a result of further recovery from the effects of the world war.

MINERALS

Zinc.—The zinc situation remains none too hopeful on account of the zinc concentrates produced as a by-product in the differential flotation of lead-zinc ores. Lead miners are only moderately happy after having had higher prices a year or two ago. Efforts are being made to find increased uses for lead and zinc, and even copper, in order to stimulate demand and lift the price. However, in the case of copper, the present conditions are better than at any time since the war. Surplus stocks have been used up, consumption has caught

up with production and with the rise in price to 16 cents per pound, the producers are very well satisfied after the lean years of 12- and 13-cent copper. Already the increased profits have been reflected in increased dividends and in a marked rise in stock market values of the shares of copper companies. Undoubtedly the Copper Exporters Association has taken an important part in stabilizing prices and in preventing a runaway market carrying the price to high levels which would ultimately be disastrous to all concerned. The organization of a Lead Institute in 1928 along the same lines as the already existing Copper and Zinc Institutes for exchange of information among producers will be a helpful factor.

Manganese.—In the case of manganese the question of future policy, as discussed a year ago, seems to be working out its own answer that the protective tariff be retained to encourage the development of the resources of the United States as a precaution against a possible future war-time need. This really means that native producers of manganese are benefited by means of a tax on the large consumers of manganese in the manufacture of iron and steel who are obliged to import manganese ore to satisfy their needs beyond what the country can supply.

Coal.—Anthracite coal operators are still striving to regain some of their market lost during the strike, and are using publicity, education and better coal as means to promote this end. Anthracite no longer has a monopoly as a domestic fuel in the eastern section of the United States and, consequently, the buyer is in a better position to receive a good fuel at a fair price than in the past. The bituminous situation has improved somewhat in that surplus stocks were lower toward the end of the year, but this industry is still admittedly overmanned and overdeveloped, and while this condition continues the mining of bituminous coal cannot be a very profitable enterprise.

Petroleum.—A somewhat similar state of affairs existed in petroleum where overproduction held down prices to a point where little or no margin existed above the cost of production. Some curtailment was in evidence but in the light of the past history of petroleum it is a question whether this curtailment will become sufficiently extended or continue long enough to do much good. What this industry needs is some remedy not yet discovered to reduce production, restore prosperity and incidentally reduce waste in this great natural resource.

MINING DEVELOPMENTS

Ore Deposits.—No marked discoveries of new ore deposits have been made. Further development of the copper-gold deposits at Rouyn, Quebec, have disclosed additional ore of high grade and the stage has been reached where a smelter and mill are in operation. Additional lead-zinc ore has also been found at Buchan's Lake, Newfoundland and the mill is in operation. The same statement is true at the Errington lead-zinc mine in the Sudbury district of Canada. Reports from Africa indicate that that continent promises to develop several big mining enterprises, especially copper. These develop slowly, due to the handicaps of distance and local conditions. It seems true that when any ore deposit was formed in Africa it was done on a lavish scale, and just as the gold deposits of South Africa have led the world, so it may come to pass that in time other metals will take a similar position.

Operation.—Technical progress during the year was mainly a gradual improvement in efficiency and economy by the use of larger and better machinery and by more substitution of machines for hand labor. Some remarkable records are being made. The Alaska Juneau Company in 1927 mined 4,267,800 tons by underground methods and secured a yield of $0.5771 per ton at a total cost of $0.5684, thus making a profit of $0.0087 per ton. In 1928, by mining higher grade ore, this margin of profit rose to over 20 cents per ton. This amazing enterprise seems to have turned the corner and henceforth should show a profit. The Miami Cop-

per Company in Arizona mined over 4,000,000 tons by underground methods in 1927 and made a sizeable profit although the average assay of all ore mined was only 0.855 per cent copper or 17.1 pounds of copper per ton of ore. At Ojuela, Durango, Mexico, a mine tunnel 5,000 feet long was driven at an average rate of 714 feet per month. The record for a single day's work was 40.2 feet.

Advance in Mechanism.—Included among the special advances are the following: the use of aerial mapping and the various methods of geophysical prospecting for locating new ore bodies and determining their extent is finding broader application. A regional meeting of the American Institute of Mining and Metallurgical Engineers in Boston in August was devoted entirely to this subject. More electricity is used for power. Larger electric mine locomotives have appeared. A new Marion electric shovel for coal stripping has a dipper holding 15 cubic yards. Small Diesel locomotives for mine work are on the market. The wire saw is finding employment in the quarrying of slate with resultant economies. Portable compressors are making advances in design and scope. Rock drills are lighter and more powerful.

Drilling Accessories.—After many years of experiment the Anaconda Company is reported to have evolved a successful detachable drill bit and had adopted it for general use. An improved hollow drill steel made by the copper core process to give a smooth inside bore is reported to reduce breakage of drill steel. Better illumination for the miner at work is advocated as a means of reducing accidents. The use of hard hats and of boots with stiff and resistant toe caps lessens injuries to the head and feet. In oil-well drilling the rotary method is gaining and a system of securing a core for record when using the percussion or cable tool method has been worked out successfully. Geophysical prospecting is especially successful for oil. The Pohle air lift pump, using either gas or air, is being applied more and more in place of rod pumps for oil. Increased yields of oil are being obtained by utilizing water, gas, or air, under pressure, to push the oil out of the sands.

ORE DRESSING

Flotation continues as the leading phase of development in ore dressing. The most up-to-date literature is the revised edition of *Trend of Flotation* by Weinig and Palmer which appeared as the issue of the *Colorado School of Mines Quarterly* for April, 1928. Another valuable book is entitled *Flotation Practice*, published by the American Institute of Mining and Metallurgical Engineers and comprising all the papers on this subject read at the meetings in Salt Lake City in August, 1927, and in New York City in February, 1928.

Differential flotation of copper from iron sulphides and of complex ores of lead, zinc, iron and copper has progressed still further and has had a marked effect on the economic status of the metals in question and especially on lead and zinc, taking also into consideration the spread of electrolytic zinc plants. It is significant that during the last seven years the lead produced by flotation in the United States increased four and one half fold and the zinc thirteen fold. The latest application of flotation is in the native copper ores of Lake Superior where it promises to give an added recovery of 2 to 4 pounds of copper per ton of ore with no extra cost for milling and with a resultant decreased cost of smelting the higher grade of concentrates yielded by flotation. Another new application is in the recovery of fine phosphate rock in the South.

Dressing Improvements.—Noteworthy items of ore dressing improvements are: satisfactory development and greater use of the Newhouse gyratory crusher and the Symons cone crusher; Williamson end vanes and Straub rib cones for more thorough mixing and higher efficiency in fine grinding in ball mills; improved classification by the Fahrenwald classifier and better filtering by the Dorr internal drum filter; improved technique with greater refinements and closer control of conditions and re-

agents in flotation; replacement of pneumatic flotation cells using porous bottoms by the simpler and more economical pneumatic cells of the jet type; yield of richer concentrates by additional steps of flotation for reclaiming, either with or without further regrinding. Coal preparation also has improved in that plants are better constructed and operated and the whole operation is being subjected to thorough study. The Rheolaveur system of coal washing has made great strides.

Copper Milling.—For very illuminating detailed figures showing how copper milling has been simplified, costs reduced and yields increased during the past five years, the reader is referred to an article on "Concentration Trends" by W. B. Cramer in the *Engineering and Mining Journal*, October 27, 1928 (page 675).

LABOR

The labor situation remained very satisfactory throughout the year. The bituminous coal strike petered out and no other strikes of any consequence occurred. For the benefit of labor, many large copper companies voluntarily raised wages when the price of copper reached 16 cents per pound. The most serious metal mine disaster of the year was the fire in the Hollinger gold mine in Canada in February when a total of 39 lives were lost.

COAL AND COKE

By R. Dawson Hall

Engineering Editor, *Coal Age*

COAL PRODUCTION

Decline In Output.—Bituminous coal output declined in 1928 about 25,000,000 tons or 4.8 per cent to 492,755,000 net tons. Anthracite production dropped about 4,000,000 tons or about 4.9 per cent to 76,600,000 net tons. Thus both kinds of coal suffered an almost equal slump. Part of the decline in bituminous output was due to the depletion of coal stocks. The United States Bureau of Mines reported a decrease of 14,400,000 tons in storage between Jan. 1 and Oct. 1. There was no such reason, of course, to explain the reduction in the output of anthracite. Nor can the decline in anthracite production be ascribed in part, as perhaps can be the output of bituminous coal, to the much-questioned decline in business activity. Some losses must be credited to increased economy in the use of fuel, to the introduction of substitutes for coal such as water power and oil, and to the decrease in the quantity of coal used by railroads in the haulage of coal.

Elements In Redistribution.—In the economy of coal production, 1928 is notable for the death of the long-threatened Jacksonville scale and for the successful operation of mines non-union in union areas; these together have caused a redistribution of coal output among the various mining districts. On Feb. 8, while work was still proceeding under the terms of the Jacksonville scale, a wage conference was held in Chicago between the miners and operators of Illinois in accordance with an agreement made in 1927, but this conference deadlocked on the appointment of a committee. The mine workers were willing to have as many operators as miners on the board but could not agree to the proposition made by the operators that an eleventh man be appointed by the Chief Justice of the United States.

Operator-miner Negotiations.—On March 28 the Coal Operators' Association of Illinois definitely broke up its lengthy conference with the union. On March 31 the temporary agreement came to an end. The strip-pit owners of Indiana, because their operations had been profitable, renewed the agreement for a year, and 15 mines in Illinois, some strippings and some highly mechanized shaft mines,

continued working under the Jacksonville rates. Sixty-five others in Illinois and 131 in Indiana, many of them among the largest in those states, shortly followed suit.

But the matter was by no means settled, for in May only 105 mines out of 400 in Illinois were producing coal and these operated on an average only 13.9 days. Thus hard pressed the mine workers in parts of Indiana and Illinois were, by June, up in arms aganist their leaders, some of the locals in the latter state actually electing men to replace those in office. John L. Lewis, international President, United Mine Workers of America, and Harry L. Fishwick, President for the state, were bitterly censured. Many of the mine workers realized that the mines could not work with any regularity under the high Jacksonville scale. Even though other companies signed the scale temporarily in June, the condition continued to be so bad that Mr. Lewis felt obliged to call an executive board and policy committee meeting for July 10 and 11.

Illinois Wage Agreement.—On July 18, Mr. Lewis reported that the policy committee of the union had passed a resolution which authorized the respective districts of the Central Competitive Field and the outlying districts "to enter into wage negotiations with their respective operators upon a basis mutually satisfactory." Thus permitted to make a separate contract the Illinois operators and miners on Sept. 1 agreed to a scale reducing the day rate from $7.50 to $6.10 and the tonnage rate from $1.08 to 91¢. This pact after ratification by the vote of the miners became operative, Sept. 16. It runs to March 31, 1932.

Wage Scale Changes.—The Southwestern districts and those of central Ohio cut their rates to the $5 level. The Rocky Mountain Fuel Co., in northern Colorado, presided over by a devoted friend of union labor agreed to raise its rates from $6.77 to $7. In the Pittsburgh region, central Pennsylvania and northern West Virginia, the operators declined even to parley with the union. The Southwestern agreement runs from Sept. 1, 1928, to March 31, 1931; the Ohio contract and that of the Rocky Mountain Fuel Co. from Sept. 1, 1928, to March 31, 1930. The Illinois agreement resulted in some strikes but these were ineffectual.

Indiana Agreement.—On Oct. 18, the Indiana coal operators and mine workers came to an agreement on wage rates the same as has been recorded for Illinois except that the contract is to run only from Oct. 31, 1928, to March 31, 1930. The wage for mechanized mining is set at $9 a day, flat scale, whereas in Illinois men loading on conveyors get $8.04 and miners working on loading machines get $10.07.

MECHANIZATION OF MINING OPERATIONS

Improvements.—The coal industry continued in 1928 to extend and improve the mechanization of its operations, hampered, however, as always by the almost inevitable lack of concentration and by the limitations in height, width and illumination of its mine workings. One branch of the industry, open-pit operations, this year planned remarkable progress though its purpose will not be achieved till some time in 1929.

Bigger Shovels for Stripping.—The coal industry has long set the pace in the use of big shovels for the stripping of coal. Up to the present the largest had a capacity of 8 cu. yd. A 15-cu. yd. shovel scooping at one bite 7 x 7 x 8 ft. of material is now being constructed for the United Electric Coal Companies. This shovel will be largest in the world as to dipper capacity, physical size, output and power. The shovel boom will be 120 ft. long and the dipper stick 82 ft. Thus it will be able to lift material to a height of from 90 to 100 ft. and to reach out over a radius of 150 ft. from the center of operations. The shovel will weigh 1,550 tons. Drop-bottom cars of 40 tons' capacity will haul the coal over 85-lb. rails to the tipple which will be equipped with seven railroad tracks. Another equally large shovel will be installed during 1929

and also a drag-line excavator built to handle eventually a 12-cu. yd. shovel. A 20-cu. yd. shovel is said to be under design.

The Northern Illinois Coal Corporation is using a 12-yd. shovel which has handled an average of 15,481 cu. yd., every 24 hr., working three separate shifts. In Wyoming the Wyodak Coal and Manufacturing Co. is taking off 25 ft. of cover by hydraulic methods from an 85 ft. seam of coal. A shovel lifts the coal into a hopper from which it passes onto a belt and is carried from the open pit to the tipple.

Loading Machines.—During the year no new type of loading machine was brought into commercial operation. Nevertheless several changes were made in existing designs which have rendered them more efficient than before, and new records were made by existing machines. Thus one machine loaded in a month, in the driving of rooms and entries at a mine of the Pittsburgh and Erie Coal Co., Braznell, Pa., an average of 466 tons per 8-hr. day, and these rooms and entries were driven forward in this process an aggregate of 105 ft. daily. Another machine averaged in an entry at the New Orient mine an advance of 29 ft. per 8-hr. day and made a maximum progress of 52 ft. per day. This same machine has under more favorable circumstances advanced 91 ft. daily. At a mine of the Marion County Coal Corporation, Centralia, Ill., with room workings the average tonnage per machine for a month was 300 tons daily.

These records and others less large but still good have convinced almost the entire mining fraternity that mechanization is feasible and indeed necessary for continued existence and much progress is being made the country over. It has been estimated by L. E. Young that the total capacity of the so-called mechanical loading equipment installed is 35,000,000 tons per year in an 8-hr. day 200-day year. This includes, however, equipment where the coal has to be fed to the machine by hand shoveling but where at the same time the lift is so greatly reduced that this work can be done with much less than the customary effort.

Coal Cleaning.—Producing companies are making renewed efforts to reduce the quantity of bone and slate in the coal shipped. Because of competitive conditions coal cleaning has been abnormally active; perhaps at no time has so great an activity in the construction of new coal cleaning plants been exhibited. One large bituminous coal corporation, the Pittsburgh Coal Co., realizing the economies to be derived from large coal-cleaning units has erected and is erecting big preparation plants to treat the coal from several mines as has long been the custom in the anthracite region.

At the Champion plant of the Pittsburgh Coal Co. the coal is brought from the mines by railroad for treatment. The capacity of the plant is 7000 tons per 8-hr. day which is believed to be larger than at any other single location. This plant washes coal up to 4 in. diameter.

Some new washery systems have been contributed by British engineers. One is practically a development on a large scale of the float-and-sink test which has been known for years. In this test a liquor of high specific gravity is obtained by dissolving in water some solvent chemical. Zinc chloride is generally used. Dr. R. Lessing uses calcium chloride, which having a lower specific gravity is suited for the floating of only a light coal. However, it is doing excellent work according to reports on an anthracite coal of low inherent ash content and therefore of relatively low specific gravity. Prior to the immersion the coal is freed pneumatically of all dust.

Another system is that of George Raw, known as the Static Dry Washer. It was described at the World Power Conference in London. It makes use of a bed of coal several inches thick which is rendered fluid by air driven through the fine openings on an oscillating table. The air pressure is such that with the bed maintained no "pipes" or breaks are made in the coal mass. The air pressure is varied by a system similar to

that which creates resonance in organ pipes. This creates stratification of the material according to gravity. The top of the mass is skimmed off twice for clean coal, then a layer of middlings is removed and the lowest layer is chuted into a refuse car or conveyor. The middlings are returned to the feed for retreatment. It is claimed that coal between 2 in. and 0 can be treated without screening. Several plants have been built and more are in the process of being constructed.

PETROLEUM

By Ernest R. Lilley
Associate Professor, New York University

CONSUMPTION

At the close of 1928, the American oil industry was able to report the continuance of the rapid increase in the demand for its major product, gasoline, that has characterized every year since the World War. During the first ten months, the daily consumption of this product averaged 897,000 barrels as compared with 821,000 barrels for the corresponding period of 1927. Exports increased in a similar manner, the daily average rising from 123,000 barrels to 149,000 barrels. The use of fuel oil for industrial purposes and as a marine and railroad fuel showed a moderate increase. Fuel oil continued to displace coal in domestic heating. However, the total consumption for this purpose is not yet sufficiently large to have any marked effect upon the condition of the oil industry as a whole. The demand for lubricants and waxes showed a substantial increase over 1927 in both domestic and foreign markets. Exports of kerosene were considerably in excess of those of the previous year, but domestic consumption showed a slight decline.

PRODUCTION

Estimates.—The final estimate of the production of crude petroleum in the United States during 1927, as prepared by the Bureau of Mines, gives a total of 901,129,000 barrels. This includes oil consumed on leases as well as that actually marketed. The production figures available for 1928, at the time of writing, included only the quantity of oil actually marketed, and were, therefore, not strictly comparable. When allowance is made for oil consumed on leases, it would appear that the total production for 1928 is approximately 900,500,000 barrels, a decline of less than a million barrels. The high rate of production brought on by the simultaneous development of a number of gusher pools in 1927 continued despite the proration of production in nearly all of the country's major pools, the shutting down of a number of discovery wells, and a concentrated effort upon the part of all of the larger producing companies to postpone all exploration and development work until substantial quantities of oil had been withdrawn from storage and better prices could be secured for their product.

Natural Gasoline.—As a matter of fact, the quantity of new oil available to the market during 1928 was substantially higher than ever before. The recovery of natural gasoline from natural gas increased ten per cent over 1927. As natural gasoline supplies approximately nine per cent of the total quantity of gasoline sold by refiners, this is of considerable importance. In addition, the availability of large quantities of low priced crude oil in Venezuela and Colombia led to substantial increases in imports from those countries that more than balanced the decrease in imports from Mexico and the small increase in exports of crude oil from the United States. The increase of net imports for the year was approximately 20,000,000 barrels.

REGIONS OF PRODUCTION

Texas.—West Texas more than lived up to the optimistic predictions

made in 1927 concerning its future importance as a center of oil production, and at least partially eclipsed the Seminole district of Oklahoma as the market leader. In April, because of competitive drilling in the Hendricks pool the production of West Texas rose to a daily average of 371,663 barrels, a total far in excess of the transportation facilities then available to remove the oil. Since that time, the actual production has been regulated by proration agreements, the daily average for the remainder of the year being approximately 330,000 barrels, the maximum quantity that could be removed. However, the actual production bears little relationship to the potential yield, hour gauges showing the potential production in the two major pools, Yates and Hendricks alone, as greater than the actual production of the whole country. It is not probable that production in these areas could be maintained at such a rate for more than a few days if all of the wells were permitted to flow at capacity, but the gauges do serve to indicate the extreme importance of the area as a center of production during the coming year.

Oklahoma.—During the first half of the year, the production of the Seminole district of Oklahoma declined steadily from its peak of 529,000 barrels daily on July 30, 1927, to approximately 240,000 barrels a year later. However, with the termination of drilling restriction agreements in the Little River pool of this district and in the St. Louis-Pearson area immediately adjacent to it, the production of the area rapidly increased, the daily average for the latter portion of the year being maintained at more than 400,000 barrels. Other pools under development promise to maintain that rate at least during the first half of 1929.

Pennsylvania.—The steadily increasing demand for lubricants made from the high quality crude oils of Pennsylvania led to much drilling activity in the old districts of that state and to some increase in production. The amount of oil produced is small compared to that of the country as a whole. Geophysical prospecting has more than doubled the number of known salt domes in southern Louisiana and Texas and thus added very materially to the amount of potential oil production of the section. As most of the land near these discoveries is held by companies who can afford to postpone development work until better prices can be secured for oil, the exploration for oil adjacent to the salt masses has progressed in a leisurely manner, and has added comparatively little oil to the production of the country up to the present.

California contributed its usual quota of new discoveries. Elwood, in the Ventura area, is the most active of the newly discovered pools. Kettleman Hills, a much prospected structure in the San Joaquin Valley, was proved to contain commercial quantities of high grade oil, but the depth of the producing horizon will make development slow. An area of future potential importance was found at Fruitvale on the east side of the San Joaquin Valley. It remained for the two old pools, Long Beach and Santa Fé Springs, to supply the bulk of the flush production. This came from high pressure, thick, oil-saturated sands lying between 6,000 and 8,000 feet below the surface.

PRICES AND STOCKS

At the close of 1927, the quantity of crude oil and refined oil in storage in the United States was 586,589,000 barrels. Approximately, 20,000,000 barrels were added during the first few months of the year. Since then, production has kept very close to consumption, the quantities of the different types of oils in storage varying somewhat but the total remaining approximately the same. Except in the Appalachian area, where local factors controlled the situation, the price of crude oil has remained low throughout the year. In the middle of the summer, Oklahoma 36° Baume oil was raised 25¢ a barrel to $1.36 a barrel, and West Texas high sulphur oil was raised 5¢ to 65¢ a barrel. Prices were increased similarly in other sections. On the whole, refiners

fared better than producers. While fuel oil prices remained at low levels, those for gasoline averaged substantially above prices of 1927.

GENERAL CONDITIONS

The continuance of low price levels forced both producers and refiners to be most conservative in their policies. Thus, while any technical advances that tended to decrease the cost of drilling. producing, or refining were taken up eagerly, executives were generally unwilling to bring forward policies of expansion that would entail the expenditure of large amounts of money. Thus, the number of wells drilled during the year was substantially lower than during the last few years. The number of new cracking units under construction was very much smaller than at any time in the past five years.

It would appear that the oil industry is entering a new phase in its development. The cracking unit has given the refiner the ability to materially increase or decrease his gasoline production without changing the quantity of crude oil run. The simultaneous proving of large reserves of oil in West Texas, California, Venezuela, Colombia, and other areas has postponed for the next few years the danger of exhaustion of oil supplies. At the same time, it makes it necessary for the oil business to develop some means of avoiding the constant recurrence of periods of overproduction and their accompanying disadvantage of unprofitably low prices.

COPPER

By Leonard S. Austin

Mining Engineer, Los Angeles

INDUSTRIAL SITUATION

Sales and Consumption.—During the year, the domestic sales of copper have increased so that the world production promises to be upward of 1,880,000 tons, which is 12 per cent more than last year. Increasing demand means increasing consumption, and increasing prosperity in this and related industries. While copper is at a little over 15 cents a pound, which brings a reasonable return to producers, the recent price-advances have been moderate. Increased income to producers means more expansion in research and improved technique or modernization of plant and equipment. Still, as is generally the case, the so-called marginal mines are working at no profit. The status is one satisfactory to all concerned.

NEW PROCESSES

Oxyacetylene Torch.—In mining the ore in stopes, a recent improvement involves the use of the oxyacetylene torch, which floods the stope with light, and so reveals the conditions of the hanging, where danger from rock falling may occur; it also aids in getting out the ore.

Storage-battery locomotives give much flexibility in following drifts and grades in mining. For the mucking or removal of ore and waste from the drift or stope into the mine car, the loading scraper is replacing laborious hand-shovelling.

Concentration.—Until recent years, gravity concentration was the only method used on ores. Later, for magnetic ores, electrostatic separation was employed, giving products in which the blende was freed from iron. At present, ores, which until now have been considered useless because of (1) their nature; (2) their fineness (as slimes); or (3) their lack of richness as low-grades, have been concentrated with separation of the constituent metals. In effect the presence of 8 to 10 per cent or more of zinc in concentrates increases the smelting expense, and lead is lost in the slag. Slimes, if present, can now be concentrated by selective flotation. Finally by this method, it has been possible to extract from the ore up

to a 96 per cent recovery of the copper in a 1 per cent ore, that is a loss of only 0.1 per cent entering the tailings.

MINING METHODS

A variety of mining methods is employed in copper mines, depending on the grade of the ore, the fineness of the walls and hanging, and the shape and size of the ore-bodies. In the lime-replacement ore-bodies, the miner may employ: (1) overhead square-setting and fill (this applies to small irregular ore bodies); (2) underhand square-setting and fill (preferred for larger, thicker ore bodies); (3) horizontal panel top-slicing, using drag-scrapers (applicable for very heavy ground, and where the back has been thoroughly prospected, and will follow down readily).

In these replacement-primary ore-bodies, where the ore and the walls are firm, some modification of the cut-and-fill method is used. In the porphyry ore-bodies several methods may be used: steam or electric-shovel pit-mining or block-caving on that portion of the ore lying too deep for the power shovel. While some ore is taken out by drift or tunnel, generally, it is hoisted through shafts. Hand tramming is employed to transfer the ore to the main chutes, thence to be dropped to the haulage levels. At these levels, the ore is transported in trains by electric locomotives to pockets at the main hoisting shaft, and from there to the surface is hoisted in skips.

SMELTING METHODS

An outstanding example of improved results in selective flotation of low-grade ores containing small amounts of chalcopyrite with much pyrite and siliceous gangue is that at Cananea, Mexico, where in 1923 gravity and oil flotation was used. From 1926 on, selective flotation was substituted, using zanthate of potash in a lime circuit. This change increased the ratio of concentration from 2.65 to 10.7 in the one, while the resultant tonnage to be fed to the smelter decreased from 622 to 140 tons daily, the copper in the concentrates was 21.26 per cent, the recovery 91.7 per cent. Dropping the pyrite and lowering the silica content means that the amount of crude ore to be smelted daily is now about one-fifth of what it was in 1925.

PRODUCTION

Africa.—While the United States is at present the largest producer of copper in the world, yet attention should be given to the developments of the metal in foreign countries. Thus, Africa is destined to become a producer of copper on an immense scale, since mining processes are advancing and the most modern metallurgical equipment and methods are being adopted. Looking into the future, the total output of the Union Minière du Haut Katanga should reach 200,000 tons or more yearly, as the second and third units of its leaching plant come into operation. Freight costs will also be reduced over a shorter railroad delivering the copper to a west coast port, which should effect a saving of at least $20 per ton. Results point to the production and sale of 36,000 tons of electrolytic copper yearly.

Changed Methods.—Now that gravity and flotation concentrates of upwards of 30 per cent copper are made, it would appear that the blast-furnace and the reverberatory are destined to be eliminated. In such case these high-grade concentrates would go direct to the converter, where a suitable matte is produced to be blown to blister copper. The sulphur content of the molten matte should be such as to ensure the heat needed in the converter reactions. It would appear also that, to supply enough heat, the matte should be melted in a cupola furnace, or that the reactions in the supply of silicious copper-bearing ore should be maintained and that perhaps preheated air should be used for blowing the converter.

Leaching.—In connection with copper leaching, it is proposed that a high-grade pyrite concentrate should be made. The pyrite is then to be floated, roasted for the production of

sulphuric acid for the following leaching operation, while the iron, of as high as 64 per cent Fe, is used as iron ore for the iron blast-furnace.

Investigation by the U. S. Bureau of Mines on leaching of low-grade oxide-sulphide copper ores by means of a ferric-sulphate sulphuric acid solution indicates (1) that up to 80° C. the higher the temperature, the more rapidly may the iron present be oxidized, (2) that there should be at least three times as much oxygen as sulphur dioxide in the in-going gas and that the initial solution, if completely reduced, should not contain over 1 per cent of sulphuric acid; also (3) that the maximum capacity for converting the sulphur is found when the solution has an iron concentration of about 0.5 per cent.

Smelting Operations.—One of the most notable of the smelting undertakings of the year has been the blowing in or rather the firing up and getting in operation of the Noronda Smelter, begun November 21, 1927. Today the production of the plant is at the rate of 3,000,000 lbs. of blister copper monthly. The whole undertaking shows what can be done in the dead of arctic weather with temperatures dropping as low as 20° F. below zero. The works, as built, had brick or concrete walls and a roof 4 in. thick. It was found in the severest weather that the ore, though containing but 3 per cent of moisture, would hang up in the cars when these were inverted at the dumper. Therefore, snow-sheds were built to house the track from the shaft to the crusher bin. The rotary dumper takes seven three-ton cars at once. For the two reverberatories eight roasters were provided. However, since the first reverberatory is smelting 900 tons daily, but six of them are needed. In the event of starting the other furnace, more roasters would be required, each to have seven roasting and one drying hearth. Such roasters would have at each hearth four air-cooled reënforced steel arms which would discharge hot air upon the lower hearths. These arms take up less space than the cast-iron ones and so there is room for a larger number of hearths which also means increased capacity per roaster. For starting these, powdered coal is used. After 24 hours of such heating, calcining begins and by the time the third day has come, the furnace is roasting properly.

Reverberatories are 25 by 100 ft. inside dimensions. The one started has a recuperator or hot-blast pipe-stove. With the draft through this and that due to opening the bypass to the stack, there is burned 90 tons of coal in 24 hours, being 10.7 per cent of the charge. Before the furnace was constructed, the ground was levelled by tamping in clay and this was dried out using salamanders. On this hard dried surface, the brick side-walls were erected. The bottom was raised to the level of the tap hole by filling in with 3½ ft. of silica sand with a 4-in. top layer of sand mixed with other sand equally fine but containing some iron and alumina. In fusing in this bottom wood fires were started at the firing end November 21, 1927, and gradually increased until December 1, when the two center powdered-coal burners were turned on at the rate of 30 lbs. coal per minute. In the afternoon, these were shut off and the two outside burners were started. The burners were alternated every six or eight hours in this way until December 12th, when all four were put on. The bottom now began to fuse at the firing end and by next day the bottom near the skimming door was fusing, and the four burners were taking 100 lbs. coal per minute. Next 15 tons of calcines and 10 of siliceous ore were charged; then three hours later 75 tons of calcines and the fire was decreased. Next day, the charge was fairly smelted, the burners were shut off, the furnace sealed up. In the afternoon, all four burners were put back. With the furnace again hot, regular charges were put in, and on the next day, the first matte was tapped, assaying 23 per cent in copper. A week later trouble developed and the bridge-wall was melting away, so the bridge-wall ends, including the air ducts, were bricked up,

allowing them to fill with slag and above this with sand. The elimination of the bridge wall has resulted in increasing the capacity of the furnace.

As to the second reverberatory, this is to be equipped with a waste-heat boiler to serve to heat the new concentrator, to heat the smelter buildings and to cool the furnace gasses so that they will not melt out the lead flashings in the stack. This furnace will have no recuperator and so will have less capacity than the first one.

GOLD AND SILVER

By Charles W. Henderson

Bureau of Mines, Department of Commerce

GOLD PRODUCTION

Mining Output in the United States.—Gold production in the United States in 1928 did not vary much from the 1927 production of $45,418,000, and the world production remained at about $400,000,000. The highest point in gold production in the United States was in 1915, when the record was $101,036,000. It has stood between $45,000,000 and $52,277,000 annually during the period 1920-1928. During the period 1917-1928, dry and siliceous ores yielded about 63 per cent of the total output of gold; placer mining 23 per cent; copper ores 10 per cent; and all other ores 4 per cent. During the last 22 years, nearly two-thirds of the production has come from dry and siliceous ores. The production of this class of ores has decreased 60 per cent since 1915 and no new large bodies of ore of this class have recently been uncovered in the United States. The yield of gold from placers in 1928 was less than half that of the average of the years 1906 to 1916, and no increase can be expected from that source, except from Alaska, where several new dredges installed in 1928 at Fairbanks produced during the last half of the year on drilled gravels which will last for many years.

GOLD AND SILVER CONSUMPTION

The Director of the Mint reports that gold furnished for use in manufactures and the arts in the calendar year 1927 was United States coin $3,500,000; domestic and foreign bullion and foreign coins $29,357,491, a total of new material so used of $32,857,491; and old material $26,461,237, making a total of $59,318,728. The silver so used in 1927 was 38,648,717 fine ounces. According to R. V. Williams of Buffalo, in *The Metal Industry* (New York) for April, 1927, approximately $20,000,000 worth of gold bullion is consumed annually by dentists, also a large quantity of silver and platinum.

The monetary stock of the United States at the end of the calendar year 1927 in banks and public treasuries including that held abroad in trust—set aside or "ear-marked"—was $4,379,268,000, and silver stock, $845,245,000; paper circulation, including gold and silver certificates (representing coin and bullion held in trust in the treasury) redeemable on demand, was $5,377,085,000. Per capita, this represents gold, $36.91; silver, $7.21; and paper $45.32. A troy ounce of gold (480 grains) is fixed by law at a value of $20.671834625323. A $20 gold piece weighs 516 grains, of which 90 per cent is gold, or 464.4 grains of pure gold. A silver dollar contains 412½ grains, of which 90 per cent is silver, or 371¼ grains of pure silver. In coining silver, one ounce is valued at $1.292929. The average commercial ratio of silver to gold, with gold considered as of legal monetary value, was 36.22 to 1 in 1927. The bullion value of the dollar was greater than its coin value prior to 1874.

Silver Receipts and Prices.—Receipts of purchased silver during the fiscal year 1928 totaled 5,568,967.37 fine ounces, the average cost of which was 57.09 cents per ounce, total cost being $3,179,578.54. The Director of

the Mint reports that the New York market price of silver during the fiscal year ended June 30, 1928, averaged $0.5757; the lowest price was $0.544375 on August 8, 11, and 22, 1927, and the highest price $0.639375 on May 24, 1928. *The Engineering & Mining Journal* gives the average price of silver for the calendar year 1928 as $0.58176, being lowest in February, $0.57016, and highest in May, $0.60298. This *Journal* says: "New York quotations are as reported by Handy and Harman, and are in cents per troy ounce of bar silver, 999 fine. London silver quotations are in pence per troy ounce of sterling silver, 925 fine (containing $^{925}/_{1000}$ silver)."

ORE CLASSIFICATION AND YIELDS

Gold.—Alaska, California, Colorado, and South Dakota only can be said to have large or important ore bodies of strictly gold ores. In Colorado, 20 per cent of the gold production comes from dry gold and silver ores, wherein the silver content constitutes 14 times the gold content; and these gold and silver ores are really complex sulphides of iron-zinc-lead-silver-gold, wherein the lead (under 5 per cent, the dividing line between dry ore and lead ore) content is frequently a vital monetary constituent of the concentrate. The recovered gold from dry ores (dry gold, dry gold and silver, and dry silver) averages as follows: Alaska, about $7.44; California, $8.95; Colorado, $5.35; and South Dakota: $4.00 to $4.84.

Silver.—Silver production in 1928 did not vary much from the 1927 production of approximately 60,000,000 ounces. Dry and siliceous ores (defined as those carrying less than 5 per cent dry assay lead and 2½ per cent dry assay copper) annually contribute about 22 per cent of the silver production: the remainder is a by-product of the base ores, respectively about 27 per cent from copper ores, 25 per cent from lead ores and 23 per cent from lead-zinc ores. Much of the so-called dry silver ores of California, Colorado, Nevada, Texas, and Utah derive some material monetary return from the lead in the ore.

Selective flotation has forced a change in the United States Bureau of Mines classification of much of the former so-called dry and siliceous gold and silver ores, by making the lead and the zinc constituent of the "dry" complex ores the principal products, resulting in a classification of "lead-zinc" of former "dry gold and silver" ores. The effect of the introduction of selective flotation is not merely statistical. Some of the "statistical" dry gold and silver ores were no longer profitable under treatment by amalgamation and gravity concentration: selective flotation made the gold and silver a by-product (though a valuable by-product) of lead, copper, and zinc, and either prevented a mine from closing down or reopened it by allowing the mining of wider stopes, with increased tonnage, lower overhead, and higher grade products, the last effect resulting in lowered cost charges for freight against the ore milled.

Weinig and Palmer, in discussing the trend of flotation in the *Colorado School of Mines Quarterly* (April, 1928), say: "The flotation process is undoubtedly the most important development in the recovery of metals from ores that has taken place during the present century. No other method of ore treatment has ever effected such great changes in metallurgical practice in so short a time. This is indicated by the number and importance of the companies now using the process, the tonnage and variety of the ores handled, the grade of concentrates produced and the high recoveries of the metals contained in the ores. In point of tonnage treated, flotation is at present leading all other methods of ore concentration."

MINING OPERATIONS IN THE STATES

Alaska (Territory).—Gold from lode mines in Alaska decreased in 1928, but Fairbanks yielded $1,000,000, almost entirely from the dredges of the Fairbanks Exploration Co. The net result for 1928 was a production of slightly over six million dollars.

California.—The production of gold from California in 1928 was 524,300 ounces as compared with 576,798 ounces in 1927. The main gold-producing counties in California are Yuba, where large dredging boats are located, near Hammonton; Nevada County, with its lode mines at Grass Valley; Amadon County, with its lode mines at Jackson, Plymouth, and Sutter Creek; and Sacramento County, with six dredges, operated by the Natomas Co., on gravel averaging about 9.50 cents per cubic yard, and on operating costs of about 6.14 cents per cubic yard. Silver production of California in 1928 was 1,504,000 ounces as compared with 2,022,460 in 1927. The California silver production comes chiefly from silver ore in San Bernardino County, mainly from the mines in the Randsburg district, followed by that from copper ores.

Colorado.—Colorado in 1928 produced $5,243,000 in gold and 4,131,000 ounces of silver as compared with $5,279,118 in gold and 3,784,605 ounces of silver in 1927. The Cripple Creek district in 1928 produced $3,098,000 in gold, as compared with $3,307,505 in 1927. This decrease is explained by the fact that the grade of ore mined was very much lower in average content, though the tonnage was greater. The Portland-Independence mill, at Victor, closed down December 1, 1928, but the Golden Cycle mill has reduced its rates to $2.25 freight and treatment for gold ore carrying $4.00 a ton, and under. Ouray, Park, Rio Grande, Clear Creek, and Gilpin Counties increased their gold output, all from dry ores. The silver increase came from increases from Clear Creek, Dolores, Eagle, Lake, Ouray, Sagauche, and San Juan Counties, and equal outputs or only slight decreases for Boulder, Gunnison, Mineral, Pitkin, San Miguel, and Summit Counties. The third year of cooperative geology and the fifth year of cooperative topography between the state of Colorado and the U. S. Geological Survey has resulted in several tangible results of ore finding.

Nevada.—Nevada is still an important gold producer, although not in the quantity produced during the heyday of Goldfield. Siliceous gold ore still produces about $2,000,000 a year and copper ore nearly $1,000,000. Tonopah still produces about $500,000 in gold, and the production of Elkoro, White Caps, Flowery, and cyanidation of dumps at Goldfield make up the remainder of the gold from siliceous ores. Silver production averages about 5,400,000 ounces, mostly from siliceous ore, the greater part of which is produced by cyanidation. Silver from lead ore amounts to about 1,500,000 ounces. The largest producers of silver are the Betty O'Neal, Tonopah Extension, Tonopah Mining, Consolidated Corte, and Tonopah Belmont.

South Dakota.—South Dakota in 1928 produced $6,615,000 in gold and 89,000 ounces of silver, as compared with $6,656,987 in gold and 96,171 ounces of silver in 1927. Most of this production for both years came from the Homestake mine, operated almost continuously since 1875, and with proved ore for at least 10 years' operation. The old Keystone gold district was reopened in 1928, and the Trojan renewed development work in the sedimentary ore bodies of the Portland district, idle since 1923.

Texas.—The Presidio silver mine, at Shafter, Presidio County, active since 1885, made its second largest annual production in 1927, with 1,000,000 ounces and its largest in 1928 with 1,200,000 ounces. The underground workings of the Hazel mine, in Culberson County, were reopened in 1928 and dump ores were shipped in both 1927 and 1928.

CANADA AND MEXICO

Mexico.—Mexico produced about the same amounts in 1928 as in 1927; namely, $14,869,000 in gold, and 104,000,000 ounces of silver.

Canada, for the six months ended June 30, 1928, yielded $18,700,000 in gold, as compared with $17,800,000 for the same period in 1927, but the gold production for the six months July to December, 1928, was not as great as for the first six months. The fire at the Hollinger mine, in the Porcupine district, Ontario, on Febru-

ary 10, 1928, reduced production from that property. The event of the year 1927 in the Quebec district was the blowing in of the Norando smelter in December, and its output is reflected in the 1928 production.

British Columbia annually produces from $3,800,000 to $5,000,000 in gold and about 11,000,000 ounces of silver. In 1928, the production was $4,068,640 in gold, and 10,570,000 ounces of silver.

IRON AND STEEL

By Edwin F. Cone

Associate Editor, *The Iron Age*

STEEL PRODUCTION

A new record in steel production for the American steel industry was the feature for 1928. For the first time the 50,000,000-ton mark was passed with an estimated production of 51,650,000 gross tons of ingots and castings. This figure is based on the 11 months total of the American Iron and Steel Institute. To this has been added the estimated output of electric and crucible steel ingots and of all grades of steel castings. The previous record year was in 1926. The 1928 record is about 5.5 per cent in excess of the best previous volume in 1926 and about 14 per cent larger than the previous year, 1927. The following table shows a few of the recent pre-war, war and post-war records in gross tons:

1928—51,650,000 *	1918—44,462,432
1927—44,935,185	1917—45,060,607
1926—48,293,763	1915—32,151,036
1923—45,393,524	1914—23,513,030
1920—42,132,934	1913—31,300,874

4,000,000-Ton Months.—A feature of the 1928 production was the number of 4,000,000- (or more) ton months. With December estimated, there were nine months last year in which over 4,000,000 tons were made as against four in 1926, three in 1927 and two each in 1925 and 1923. The year's steel record was a surprise as it was not predicted or anticipated early in 1928. Interesting also is the fact that output and demand did not fall off seasonably in November and December as has been the case in most recent years.

Finished Steel.—Last year witnessed a new record in finished steel production. Estimates by *The Iron Age* place the total at 37,300,000-tons, displacing the high record total of 34,819,038-tons in 1926 by about 7 per cent. No other year has reached 33,000,000-tons. Automobiles led in consumption of this steel with 18 per cent against 14 per cent last year. Steel for buildings and construction was second with railroads third. In output, bars were first last year as they have been for each of the last six years; the percentage was 19 per cent against 17 per cent in 1927: sheets were second at 14.5 per cent. It is these two products which go so largely into automobiles.

World Production.—Attention can here be appropriately called to the position of the American steel industry with reference to that of the world. Steel production of the world, as represented by that of 21 nations, was approximately 107,500,000 gross tons as published by *The Iron Age* in its annual review issue of Jan. 3, 1929. This contrasts with 100,-180,000 tons in 1927. Due to the expanded American output, the 1928 total for the United States was 48 per cent of the world total as compared with 44.8 per cent in 1927.

In pig iron the relation was similar. The American pig iron total for 1928 of 38,000,000-tons was 44.0 per cent of the world total of 86,230,000-tons, while in 1927 the American total was 42.3 per cent of that for the world.

PIG IRON OUTPUT

Tonnage Decline.—Pig iron presents a strong contrast to steel output. No new records were made. The

* Estimated: Others all American Iron and Steel Institute data.

estimated total of 38,000,000-tons, as published by *The Iron Age*, while larger than 1927, was the third largest since the war and the fifth largest if war years are recognized. The pig iron output last year was about 4 per cent larger than in 1927 but fell 5.8 per cent short of the record year of 40,361,146 tons in 1923. The following table gives the contrasts, the data for all years except 1928 being those supplied to the American Iron and Steel Institutes:

1928—38,000,000 *	1918—39,054,644
1927—36,565,645	1917—38,621,216
1926—39,372,729	1916—39,434,797
1923—40,361,146	1915—29,916,213
1920—36,925,987	1913—30,966,152

Comparison with Steel. — Pig iron certainly lags behind steel. It would be commonly expected that a large steel output would mean a correspondingly large pig iron output. This was the case before the war. But in 1923 the record pig iron production was contrasted with a relatively small steel output. In 1928, a new high in steel contrasts with a proportionately small pig iron production. This is explained by the fact that more and more scrap iron and steel are being used in making steel, cutting down the need of pig iron.

STEEL AND IRON PRICES

Steel Advances.—Steel prices in 1928 were on the ascending grade and the attempts of steel companies to get a larger return on the immense capital invested were bearing some fruit as the year closed. According to the composite prices of *The Iron Age*, the 1928 record for pig iron and finished steel was as follows with some comparisons:

	Pig Iron per Ton	Finished Steel per Pound
December 31, 1928....	$18.46	2.391
High for 1928.....	18.59	2.391
Average for 1928.....	17.68	2.352
" " 1927.....	18.55	2.357
" " 1924.....	20.90	2.609
" " 1913.....	14.68	1.663

The price situation at the end of 1928 and as the new year opened can best be stated in the words on the front cover of *The Iron Age* for Jan. 3, 1929: "In 1928 the best minds in this industry were bent on making their selling as intelligent as their manufacturing. And in no year has the competition in steel been so enlightened; also none has shown like gain in market soundness. It is high credit to those who led the way that so much has been done to cure a situation which many held to be as much beyond remedy as the war-habit among nations."

* Estimated.

OUR FOREIGN TRADE IN IRON AND STEEL

Exports.—In steel and iron exports the largest record since 1920 and the second largest since the war was made in 1928. The total was about 200,000 gross tons per month (scrap not included) as compared with 161,900-tons in 1927, with 171,900-tons in 1926 and with 242,300-tons in 1913, the pre-war figures. In 1920, the total was 392,400-tons per month when the world had to turn to American mills for its supplies. A feature of last year's exports was the large quantity of scrap iron and steel,—495,000-tons out of a total of 2,900,000-tons.

Imports of iron and steel showed very little change from the year before. For the first ten months, the latest data available when this was written, total imports had been 629,301 tons against 623,922 tons to Nov. 1, 1927.

New Steel Export Association.—An important development last year was the commencement of a joint effort to develop American iron and steel foreign trade on a larger scale. The United States Steel Corporation and the Bethlehem Steel Corporation formed a common export organization—the Steel Export Association of America—thus providing a single outlet for 75 to 80 per cent of the rolled steel exported.

ECONOMIC DEVELOPMENT

Mergers.—There were no large consolidations of steel companies during 1928, though some had been expected. The largest one planned was that of

the Youngstown Sheet & Tube Company and the Inland Steel Company, but this fell through. One of the most important was the acquisition by the American Rolling Mill Company, Middletown, Ohio, of the Ashland Steel Company, Ashland, Ky., adjoining the blast furnaces of the Norton Iron Works Co., which the Middletown company had bought in 1927. The Republic Iron & Steel Co. acquired a controlling interest in the Steel & Tubes, Inc. The Empire Steel Corporation was formed early in the year by the acquisition of six northern Ohio sheet mills.

Research. — Technically marked progress was made last year but there were no startling developments. In research the United States Steel Corporation established a large department to study steel problems. Group action by other companies was a feature judged necessary to finance and man the precise and intensive researches required for perfection of specialties. In gray iron very large tonnages of repetitive work in growing single foundry units was unquestionably the most noteworthy development of the year. Rapid progress in the development and perfection of stainless steel and rustless iron products was made, bringing nearer the realization of "a rustless age."

The 1000-Ton Blast Furnace.—A word should be said about the modern large blast furnace. The 1000-ton per day pig iron furnace has arrived. Last year one company increased the capacity of one of its old furnaces so that 1000-tons or more of pig iron per day were made regularly. Another company announces plans to build a 1000-ton furnace this year. The tendency in blast furnace practice is to have fewer furnaces with larger output.

ZINC

By W. R. Ingalls

Consulting Engineer, New York

Production.—The world's production of zinc in 1928 was about 1,400,000 metric tons, compared with 1,329,000 in 1927. For economic reasons, a sharper distinction than heretofore must now be made between the United States and the rest of the world. The zinc production of the United States in 1928 was about 560,000 metric tons, compared with 556,600 in 1927. Elsewhere, which means principally Europe, the production was about 840,000 tons in 1928 compared with 772,500 in 1927. Practically all of the increased production occurred, therefore, outside of the United States, the reason for which will be hereinafter explained.

Consumption.—The world's consumption of zinc, both at home and abroad, appears to have been about in balance with the production of the metal, the quantity of stocks in first hands exhibiting relatively unimportant changes. Just as last year, these statistics in themselves are no explanation of the condition of the market. In 1927 there was a decline in prices. In 1928 there was continued depression at a relatively low level.

Prices and Markets.—In 1927 the average price for spelter was £28.5 London and 6.24¢ St. Louis. In 1928 the January average was £26.125 London and 5.64¢ St. Louis. The October averages were £24 London and 6.25¢ St. Louis. The rise in St. Louis reflected the unwillingness of American smelters to operate at a loss and a general determination to take advantage of the protective tariff. The American zinc industry therefore cut loose economically from Europe and established a new condition substantially the same as that previously prevailing in lead. On the other hand, the European market, which is bound to be subject to international movements, exhibited the results of the commercial policy of *laissez faire*. An effort was made, however, to correct

this condition which was threatening general disaster, by the organization of a cartel, that was consummated in May and which included all of the European metallurgical concerns. The underlying thought in this was to keep things from getting worse rather than to elevate the price, and its organization is rather loose and unconvincing.

Excessive Ore Supply.—The immediate trouble with the zinc industry all over the world has been the increased supply of ore resulting from a general introduction of the process of selective flotation, together with increasing application of the electrolytic process of zinc extraction, which has made it possible economically to beneficiate ores in remote places. Consequently at the beginning of 1928, although the world's stock of spelter was moderate, the accumulated stock of ore in the hands of metallurgical works, capable of quick conversion into spelter, was enormous. It is doubtful if during 1928 this accumulated stock of ore has been reduced, for, although the metallurgists outside of the United States increased their production, the miners have delivered ore to them at an undiminished rate notwithstanding the recession in price for ore which has been even more pronounced than in the price for the metal. It is the great accumulation of ore stocks and the demonstrated ability of mines to continue production that has been the incubus hanging over the market. At the same time the production of metal has been increased by new electrolytic plants going into operation at Anaconda, Mont., at Kellogg, Idaho, in Upper Silesia and in Northern Rhodesia, while some of the older plants have increased their capacity.

Efforts at Curtailment.—In the United States an industrial consensus of opinion led to the effort to preserve some profit in the industry by gauging the production of spelter to the consumptive demand. This compelled a curtailment of ore production, especially in the Tri-state district, which is the least favorably situated big producing district, owing to the relatively low grade of its ore. The distillers, who had previously been buying in the Tri-state district, more and more diverted their business to the mines west of the Rocky Mountains where ore was cheaper.

Over-Production Tendencies.—This brings out a fundamental trouble of the zinc industry of the world, viz., the absence of integration. That is to say, the production of ore on the one hand, and the smelting of it and marketing of the metal on the other hand, are to a large extent done by different groups. The production of ore being from a multiplicity of mines, whereof the number is too great to bring about harmonious action, there can be no such thing as intelligent planning and the adjustment of the liquidation of their resources to consumptive requirements, and there is consequently a constant tendency towards overcapitalization and overproduction with severity of price as the only regulator. The metallurgical industry was therefore inspired in 1928 to move independently and to make efforts to protect itself.

Metallurgical Plant Improvement.—Among American distillers, metallurgical improvement in plant, constrained by the increasing supply of flotation concentrate, was in progress. Attention was drawn to this in the review of last year. During 1928, demolition and reconstruction in the direction of modernization was the order of the day in a large number of metallurgical plants, the expenditure assuming the proportions of $1,000,000 per plant. As 1928 draws towards a close, this program has been completed in some of the plants and is nearly finished in the others and 1929 will, therefore, inaugurate a materially improved metallurgical practice.

Desulphurizing Process.—The improvement in American zinc metallurgy has been concentrated in the desulphurizing part of the process, which is reflected in better results in the distilling end, but otherwise distilling practice remains unchanged. The New Jersey Zinc Co. is, however, developing a new type of furnace of

which great expectations are entertained.

Improvements in Europe.—In Europe also there has been a considerable movement towards improvement of practice. There has been an extensive introduction of sintering as a part of the desulphurizing process and of electric precipitation of dust. The Waelz process of burning the zinc out of low grade ore has been extensively introduced. The fume obtained in that way is reduced to metal partly in ordinary distilling furnaces, but in one works a Roitzheim-Remy furnace has been installed for this purpose, and in Upper Silesia an electrolytic plant of considerable magnitude was put into operation, the latter part of 1928, for the beneficiation of this fume. This electrolytic plant is noteworthy not only on account of being the first to deal with such material, but also because it is the first to be operated with power generated from coal.

LEAD

By Allison Butts

Assistant Professor, Lehigh University

INDUSTRIAL ASPECTS

Coöperative Organization.—The year 1928 has been uneventful for the lead industry, save for one progressive step which may prove to be a very beneficial one. Lower prices for lead and its products have prevailed during most of the year, production has declined a little, and there are no outstanding metallurgical developments to record. The launching of a coöperative organization within the industry, however, is an event of first importance.

Lead Industries Association.—Following the preparatory work which had been under way for some time, representatives of most of the leading producing and consuming interests in the American lead industry met in New York on November 14, 1928, and formally organized the "Lead Industries Association." The Association will perform much the same functions for lead as have been carried out for other metals by the American Iron and Steel Institute, the American Zinc Institute, the Copper and Brass Research Association, the Copper Institute, and the American Silver Producers' Association. The newcomer in the field will devote particular attention to coöperation between the producing and consuming ends of the industry, which is included in the objects of some but not all of the other organizations mentioned above. The Lead Industries Association starts with a membership of nearly forty companies engaged in the mining, smelting, and refining of lead and the manufacture of lead products, and located in the United States, Mexico, Canada, and South America. The Association will collect statistics of production, marketing, distribution, and consumption of lead and lead products, will spread information regarding their use, and will engage actively in promoting health and welfare and combatting industrial hazards. The officers chosen at the first meeting were Clinton H. Crane, president; Hamilton M. Brush and Ralph M. Roosvelt, vice presidents; and Felix E. Wormser, secretary-treasurer.

Lead Production.—Until 1928, each year since 1921 recorded an increase in the world's production of lead. Last year saw the end of this continued expansion, and a decline resulted that will probably amount to nearly 5 per cent compared with the output of 1927. Production in the last quarter of 1928, however, was high, in some cases even surpassing the figures for the corresponding months of 1927. A falling off in the year's total appears to have occurred in most of the leading producing countries. The United States production decreased by about 3 or 4 per cent. It may be estimated at about

670,000 long tons (smelter output)—about 40 per cent of the world's production. In addition to this output of new metal, there was a production of about 275,000 tons of secondary lead. Production for the year was well proportioned to consumption, so that stocks remained about stationary.

Decline in Price of Lead

Price.—The average price of lead in 1928 was approximately 6.3 cents per pound, at New York. This is 0.5 cent under the 1927 average. The difference, however, was chiefly recorded in the early months of the year. In the first half, the price averaged 0.8 cent below 1927. In the last quarter of 1928, the market strengthened and figures were reached slightly in advance of the corresponding prices of the previous year.

PROGRESS IN LEAD METALLURGY

Selective Flotation.—The absence of outstanding development does not mean that progress has been lacking in lead metallurgy. Metallurgists have been quietly active in perfecting methods and studying properties. First, mention must again be made of selective flotation, the process which has meant so much to both the lead and the zinc industries in the past five years. This process accomplishes the separation of lead and zinc minerals from ores in which they exist together, enabling recovery of each; the same result is obtained when copper and iron, as well as lead and zinc, are present. These so-called "complex ores" occur in great quantities, and are found frequently at depths in mines where the surface deposit is largely of relatively pure character. They were formerly untreatable profitably, so that the discovery of a treatment method has been equivalent to the discovery of huge new deposits of ore. This process and this alone has enabled the lead industry in recent years to meet the demands for production laid upon it and has kept the price of lead within bounds. Wider adoption of selective flotation and continued study in both application and theory has been the rule in 1928, as in the immediately preceding years. An incidental advantage accruing from improvement in flotation has been the reduction, on the average, of the zinc content of lead ores delivered to the smelter. As high zinc content is exceedingly troublesome in lead smelting, a growing evil has been to a considerable extent alleviated and some recent modification in smelting practice has been possible.

Lead Refining.—There is a continued tendency to realize in full the advantage of the low melting point of lead. Furnace treatments in the past have been carried on at red and yellow heats, entailing high fuel consumption, high furnace costs, and high metal losses. New methods are being adopted which use chemical refining agents, carried on not far above the melting point of lead, and not only have savings resulted in the ways just mentioned, but great reduction in time required and increased recovery of by-products have been gained. The Harris process, removal of copper by sulphur, and removal of zinc by chlorine gas, are the leading examples of this tendency. The Harris process was described by R. Winter (*Eng. Min. Jour. 125*, 725-8, 809-12, 1928).

In the fall of 1928, the American Smelting & Refining Company placed in operation a new plant for electrolytic refining of lead by the Betts process at its refinery at Maurer, N. J. The new plant has a capacity of 50 tons of refined lead per day. Like the similar ones at Omaha and East Chicago, the purpose is to convert inferior high-bismuth lead into lead of the highest quality, with ensuing recovery of the bismuth as a by-product.

Deterioration of Cable Sheathing.—Recent work done on the physical metallurgy of lead includes an investigation of the deterioration of lead cable sheathing. (Beckinsale and Waterhouse, *J. Inst. Metals*, No. 459. Mar., 1928.) Failure of the cable sheathing is apparently of the fatigue type, intercrystalline, and produced by small alternating stresses. Addition of 0.5% cadmium raises the fatigue limit to more than three times that of pure lead. Addition of tin and

antimony are also beneficial. In view of this recommended use of cadmium, it becomes of additional importance to record that the lead-cadmium series of alloys, and also the lead-antimony-cadmium alloys, have been studied by Abel, Redlich, and Adler, and their results published. (*Z. anorg. allegem. Chem.* *174*, 257-68, 269-80, 1928.)

COGNATE SOCIETIES

American Iron and Steel Institute.—75 West St., New York, N. Y.

American Gas Association.—420 Lexington Ave., New York City, N. Y.

American Institute of Mining and Metallurgical Engineers.—29 W. 39th St., New York, N. Y.

American Mining Congress, 841 Munsey Building, Washington, D. C.

American Petroleum Institute.—250 Park Ave., New York, N. Y.

American Zinc Institute.—27 Cedar St., New York, N. Y.

DIVISION XIII

MANUFACTURES AND TRANSPORTATION

GENERAL CONDITIONS IN MANUFACTURING

By Lawrence B. Mann

Division of Statistical Research, Bureau of Foreign and Domestic Commerce

SUMMARY OF DEVELOPMENTS

Manufacturing production in 1928 was larger than in any previous year. The curtailment of output which occurred in the latter part of 1927 was followed by a marked expansion of operations in the early part of 1928, and record production was reached in the fall months. This enormous volume of factory output was the more remarkable as it continued a general upward trend which has now been under way for a period of seven years. The increase in value of production about paralleled the increase in quantity, as there was comparatively little change in the average price of manufactured articles.

Industrial Activity.—Automobile and construction industries experienced another great expansion of activity which caused substantial increases in the output of many related products such as iron and steel, rubber tires, and refined petroleum. Production of tobacco and paper and printing also reached new high levels. There were sizeable decreases in the output of various types of textile products, on the other hand, and the activity of the lumber and leather industries was also somewhat less than in the preceding year. The increase in factory production was not accompanied by any general accumulation of stocks of merchandise.

Employment in manufacturing industries was actually somewhat smaller than in the preceding years, indicating that there has been a further increase in the output per wage earner, continuing a development which has now been under way for many years.

Exports of manufactured articles continued to increase and reached a much larger total volume than in any earlier year. This back-log of foreign trade has a very favorable stabilizing influence upon American manufacturing industries.

Growth of Manufacturing Industries.—The manufacturing industries of the United States have shown a remarkable growth during the period of 75 years for which Census figures are available. This growth has been even greater than the following table indicates, as data for hand and neighborhood industries were included in the totals prior to 1904 and information was gathered from all establishments having a total value of products of more than $500 in years prior to 1919. Statistics for recent years do not include either hand and neighborhood industries or establishments with products valued at less than $5,000.

Production Per Employee.—The most significant development in manufacturing since the beginning of the present century has been the increase in production per employee. This development was under way prior to the outbreak of the World War and it has been much accentuated in the years since the close of the war. From 1899 to 1909 the number of wage earners in factories, excluding

SUMMARY OF MANUFACTURES: 1849 TO 1925

Year	Number of Establishments	Wage Earners (Average Number)	Horsepower	Wages	Value of Products	Value Added by Manufacture
	(in thousands)			(in millions of dollars)		
1849	123	957	0[1]	$237	$1,019	$464
1859	140	1,311	0[1]	379	1,886	854
1869	252	2,054	2,346	620	3,386	1,395
1879	254	2,733	3,411	948	5,370	1,973
1889	355	4,252	5,939	1,891	9,372	4,210
1899	512	5,306	10,098	2,321	13,000	5,656
1904	216	5,468	13,488	2,610	14,794	6,294
1909	268	6,615	18,675	3,427	20,672	8,529
1914	273	7,024	22,421	4,068	24,217	9,858
1919	214	8,990	29,298	10,453	61,737	24,748
1921	196	6,938	0[1]	8,193	43,427	18,272
1923	196	8,768	33,057	10,999	60,258	25,777
1925	187	8,384	35,773	10,730	62,714	26,778

[1] Not called for on schedule.

hand and neighborhood industries, increased about 40 per cent, while the volume of factory production showed a gain of about 60 per cent. Since 1919 there has been an actual decrease in the number of workers employed in factories in spite of the fact that the output has shown a very rapid growth; the number of workers was 8 per cent smaller in 1925 than in 1919, while the total production was about 28 per cent larger. The combined affect of these changes was an increase of 40 per cent in output per employee between 1919 and 1925, a most remarkable growth.

The great expansion in the average output of factory workers during recent years has been largely due to the increased use of machinery, but it has also been much aided by more efficient management, and by a decided improvement in the education and intelligence of the employees. This increase in efficiency has resulted in material benefits to the workers; average earnings per factory worker, which amounted to $426 a year in 1899 and $590 in 1914, advanced to $1280 in 1925.

Use of Machinery.—There has been a very marked increase in the use of machinery in factories during the present century. The total capacity of prime movers in factories amounted to nearly 36,000,000 horsepower in 1925, which was over 3½ times as great as in 1899. During this quarter of a century, the average horsepower per employee doubled and amounted to 4.3 in 1925.

MANUFACTURING OUTPUT IN 1928

Commodities.—The total output of factories during the first three quarters of 1928 was 3 per cent larger than in the corresponding period of 1927, according to the index prepared by the Census Bureau, and was also larger than in the corresponding period of any other year. Analysis of this production by groups of industries indicates that the greatest expansion during the past year has occurred in the automobile industry, amounting to over 20 per cent.

The enormous production of new automobiles has had a very favorable effect upon the production of related industries; output of rubber tires was over 15 per cent larger than in the first three quarters of 1927, while production of refined petroleum and iron and steel showed gains of 10 per cent and 9 per cent, respectively.

The large increase in volume of building operations during 1928 resulted in a gain of 4 per cent in the output of the cement, brick, and glass industries: lumber production, however, was about 1½ per cent smaller than in the preceding year. The output of tobacco manufactures continued to show steady growth and was almost 5 per cent larger than in 1927. Textiles showed the largest decrease in production of any group of

industries during 1928, the decline amounting to nearly 8 per cent. Production of leather was also somewhat smaller than in 1927, but was considerably larger than in either of the two immediately preceding years.

Total Production.—After making allowances for the usual seasonal variations in factory activity it appears that the total production of manufactured commodities increased during the first two months of 1928, was maintained at an even level during the following months, and expanded during August and September to the highest peak on record. This tremendous volume of output in the month of September was caused by the activity in the automobile, iron and steel, nonferrous metal, rubber, and petroleum industries. Some of the more marked changes in output of leading individual industries during the first 9 months of 1928 as compared with the corresponding period of 1927 are shown below:

	Per Cent Increase (+)
Passenger automobiles	+ 20.6
Steel sheets	+ 14.5
Oak flooring	+ 13.8
Rubber tires	+ 13.5
Gasoline	+ 12.6
Book paper	+ 12.6
Automobile trucks	+ 10.5
Steel barrels	+ 10.2

	Per Cent Decrease (—)
Locomotives	— 48.1
Newsprint	— 8.1
Sugar meltings	— 9.2
Douglas fir lumber	— 11.3
Cotton textiles	— 15.1
Maple flooring	— 20.6
Cottonseed oil	— 37.2

It is very significant that the curtailment of factory operations which occurred in the latter part of 1927 did not continue into 1928, and that the upward trend of manufacturing output has now endured with comparatively little interruption for a period of 7 years. The enormous volume of manufacturing production in the United States is due primarily to the great buying power of the American people which has resulted from a combination of increased wages and larger dividend payments. The consequence of this larger production has been a steady improvement in living standards evidenced by better housing and increases in the per capita supply of automobiles, radios, electric refrigerators, washing machines, vacuum cleaners, and other conveniences and luxuries.

AUTOMOBILES AND TIRES AND PETROLEUM

Production of automobiles and various related products established a new high record during 1928 owing to the exceptionally large demand for new cars. The great increase in both production and sales of automobiles was partly a result of the resumption of large scale operations by one of the leading producing companies which had radically changed its models during 1927. The temporary cessation of operations by this company in the summer of 1927 resulted in a large accumulation of demand for low price cars in the earlier part of 1928. This large domestic demand for automobiles has been paralleled by record breaking exports to foreign countries.

The aggregate production of passenger automobiles, during the first three quarters of 1928, was 21 per cent larger than a year earlier, while production of trucks increased by more than 10 per cent. Automobile output increased steadily during the first three months of 1928 but was moderately curtailed in April and May. Production expanded again in June and advanced throughout the following three months, reaching, in Septmeber, a very high peak. The production of rubber tires showed a very similar trend to that of automobiles and reached record proportions in the fall of the year. About two-thirds of these tires were of the balloon type, which is now the standard equipment for all makes of passenger automobiles.

Production of refined petroleum products showed large increases in 1928. Gasoline output during the first 9 months of the year was about 13 per cent larger than in the corresponding period of 1927, while the

output of lubricating oils, kerosene and gasoline, and fuel oils showed increases of 10 per cent, 9 per cent, and 7 per cent, respectively. During the first quarter of 1928 operations at refineries were at about the same level as in 1927, but production expanded rapidly in the two succeeding quarters and reached a much larger aggregate total in the summer months than in the earlier period.

CONSTRUCTION AND CONSTRUCTION MATERIALS

Building operations, which showed slight recessions in 1927, reached new high records during the first nine months of 1928. The total floor space of buildings for which contracts were let during the period ending September 30 was 16 per cent larger than in the corresponding period of 1927, while the aggregate value of contract awards showed an increase of 7 per cent. The values of awards for industrial, residential, and educational buildings were considerably larger than in the preceding year, while awards for commercial buildings, social and recreational buildings, public buildings, and religious and memorial buildings were considerably smaller in value.

In spite of the increase in quantity and volume of building operations there was a decline of slightly less than 4 per cent in the production of ten leading species of lumber during the first three quarters of 1928 as compared with the previous year. Maple flooring output was also considerably smaller, but there was a substantial increase in the production of oak flooring. Production of Portland cement exceeded by about 2 per cent the record output of the first nine months of 1927. Structural steel shipments showed a larger gain, amounting to 6 per cent, reflecting the large amount of industrial building and the continued demand for new apartment houses.

IRON AND STEEL

The large increase in production of automobiles and the construction of new buildings resulted in a marked expansion of output of iron and steel and their products. Pig iron production, it is true, showed a slight decrease as compared with 1927 owing to the increased use of scrap iron, but the output of steel ingots was 9 per cent larger than in 1927 and that of iron malleable castings increased almost 5 per cent. Steel sheets, which are largely used in making automobiles, showed a much larger gain, amounting to almost 15 per cent, and the output of structural steel, as noted above, was also materially larger. Unfilled orders of the United States Steel Corporation increased in the first quarter of the year but later showed a moderate decline. The value of these orders in the third quarter of 1928 averaged about 15 per cent larger than in the corresponding period of 1927, in spite of the very large volume of mill production.

TEXTILES

The improvement in the textile industries which occurred in 1927 was followed by another marked recession in activity in 1928. This group has shared but little in the great industrial prosperity of recent years, except in certain special branches, such as silk hosiery, and rayon. Cotton consumption during the first 9 months of 1928 was almost 15 per cent less than in the corresponding period of 1927, indicating a similar decline in the output of cotton textiles. The reduction in output of finished cotton goods was particularly marked, owing to the prolonged labor difficulties in New Bedford, the leading producing center.

Wool consumption showed a somewhat more moderate decline than that of cotton, amounting to about 6 per cent, while silk deliveries to mills increased by almost 4 per cent. Hosiery production was slightly smaller than in 1927 and there was a decrease in the volume of unfilled orders of hosiery mills. Knit underwear production, on the other hand, increased by about 4 per cent during the first three quarters of 1928, although there was some decline in the volume of new orders that were received.

LEATHER AND SHOE INDUSTRIES

Leather and leather goods industries also failed to continue their 1927 gains but the decline in output of these products was less marked than in the case of textiles. Production of finished upper-leather in the first 9 months of 1928 was 9 per cent less than in the corresponding period of the preceding year, while the output of finished sole and belting leather declined less than 3 per cent. Shoe factories had about the same total production as in 1927; the output in the first quarter of the year was larger than a year earlier, whereas production in the second and third quarters was slightly smaller than in the corresponding periods of 1927.

PULP AND PAPER

The paper and printing industries increased their aggregate output about 4 per cent during 1928 and production of many types of paper was larger than in any other year on record. Production of book paper was 13 per cent larger than in 1927; box board increased 8 per cent and the output of wrapping paper, fine paper, and shipping boxes each showed increases of about 4 per cent. Newsprint production, on the other hand, was 8 per cent smaller than in the first three quarters of 1927 and production of both chemical and mechanical wood pulp showed small declines.

MISCELLANEOUS INDUSTRIES

Of the other manufacturing industries, tobacco and nonferrous metals increased their output, while there was comparatively little change in the case of food products. The output of tobacco manufactures has been steadily expanding for a number of years, as a result of the rapidly increasing use of cigarettes, and was nearly 5 per cent larger in the first three quarters of 1928 than a year earlier. Among the nonferrous metals the most noteworthy development was the large demand for copper, which resulted in a considerable advance in its price and an increase of over 6 per cent in the output during the first three quarters of the past year. Production of slab zinc was also larger than in 1927, but there was a marked decrease in the output of lead.

The aggregate production of manufactured foodstuffs showed comparatively little change in 1928; output of flour mills showed a further increase, while meltings of sugar continued to decline. Developments in the different chemical industries varied considerably. Production of acid phosphates and fertilizers was substantially larger than in 1927 and there was a moderate increase in the output of ethyl alcohol; whereas production of cotton-seed oil, acetate of lime, and methanol was very much smaller than in the preceding year. Production of many types of machinery continued at a very high level during 1928, but the activity of locomotive works and other factories manufacturing railroad equipment was at a very low ebb.

STOCKS OF COMMODITIES

Commodity stocks showed no tendency toward accumulation during 1928 in spite of the large increase in factory output. Stocks of raw materials for use in manufacturing averaged 4 per cent less in September than a year earlier, owing to a very marked decline in the supply of textile materials on hand. There was also a decrease in the total stocks of manufactured goods; decreases in stocks of manufactured foodstuffs, lumber, rubber goods, and chemicals more than offset increased inventories of textiles, iron and steel, nonferrous metals, and paper.

BUSINESS CONDITIONS

Factory Employment.—Both the number of employees and the total payroll of factories averaged about 4 per cent less in the first three quarters of 1928 than a year earlier. If comparisons be made between factory employment in September, 1928, and that a year earlier, it appears that there was comparatively little change in the number of employees and that their average earnings showed an increase of about 2 per cent. Employment in automobile factories, agricultural implement plants, and steel

mills showed substantial increases, while the number of workers engaged in manufacturing cotton textiles, shoes, cement, confectionery, and railroad equipment was considerably smaller than they had been in September, 1927.

Failures.—The number of manufacturing concerns which failed was about 6 per cent larger in the first 9 months of 1928 than a year earlier, but their total liabilities, amounting to $132,759,000, showed a decrease of 13 per cent. There was a greater decrease in the liabilities resulting from the failure of manufacturing concerns than in the case of either trade establishments or agents and brokers.

EXPORT OF MANUFACTURES

Exports of American manufactures amounted to almost one-tenth of the total production of our factories. This large export business has a very important stabilizing influence on the manufacturing industries of the United States as business is seldom depressed at the same time in all parts of the world. Exports of all manufactured articles, except manufactured foodstuffs, were 8 per cent larger in the first 9 months of 1928 than a year earlier, and were 70 per cent higher in value than in the corresponding period of 1922. This extraordinary growth during the past six years has been due to the ever increasing demand for highly elaborated articles. The United States is the leading exporter as well as producer of many of these articles which require inventive genius, intelligent labor, and mass production. Our exports of automobiles, machinery, and chemicals have shown an especially marked growth since the war. During the past year American exports of automobiles have shown a particularly noteworthy increase, being about one-fourth larger than in 1927.

ADMINISTRATION OF THE TARIFF

By Ernest W. Camp

U. S. Commissioner of Customs

THE CUSTOMS SYSTEM

Collection Districts. — There are forty-seven collection districts of the United States, which include one each in Alaska, Hawaii and Porto Rico. These districts contain three hundred ports of entry, one port in each district being designated as the headquarters port, at which the Collector of Customs, who is the principal customs officer of the district, is stationed. Appraisers of merchandise are designated and assigned to sixteen of the larger headquarters ports. At other ports, certain officers of the Collector's force are designated acting appraisers. Surveyors of Customs are assigned to the ports of Portland, Maine, Boston, New York, Philadelphia, Baltimore, New Orleans, and San Francisco; and Comptrollers of Customs to the ports of Boston, New York, Philadelphia, Baltimore, New Orleans, Chicago, and San Francisco.

Functions.—Although Customs is one of the oldest branches of the Government, popular conception of the functions of Customs goes little beyond the apprehension of smugglers and the examination of passengers' baggage on trains and piers. Duties collected on passengers' baggage, however, amount to only about three-fifths of one per cent of the total customs receipts. Customs receipts for the fiscal year 1928 were $573,968,772. Of this sum, approximately $3,914,417 resulted from baggage examinations, and $7,347,266 from importations through the mails, while over half a billion dollars was collected on cargo and freight importations.

Form of Entry.—All imported merchandise, whether dutiable or free, is required to be submitted to Customs for examination. If the value of an importation exceeds one hundred dollars, a formal entry thereof must be made. Certain exceptions to this re-

quirement are set forth in the Tariff Act of 1922 (Sec. 498), the principal exception covering "articles carried on the person or contained in the baggage of a person arriving in the United States."

Merchandise may be entered for consumption, for warehouse, for transportation and exportation, or for immediate transportation without appraisement. A consumption entry is the usual form and is used in cases where it is desired to pay the duty on the arrival of the importation at the port of entry and to secure delivery. If immediate possession of the merchandise is not essential and the importer desires to postpone the payment of duty, a warehouse entry may be made. Under this form of entry, the merchandise is sent to a bonded warehouse and duty is not paid until withdrawal therefrom. Merchandise remaining in bonded warehouse for more than three years becomes abandoned to the Government and is sold at public auction. An entry for transportation and exportation permits merchandise to be shipped in bond through the United States to a foreign destination without the payment of duty; and the immediate transportation entry permits an importation to be shipped in bond from the port of first arrival, without appraisement or the payment of duty, to an interior port, where a consumption entry or warehouse entry may be made.

Documents required to be furnished the office of the Collector of Customs in making a formal entry of merchandise include the entry (Form 7501), declaration of ownership (Form 3347), bond for re-delivery, production of missing documents, etc. (Form 7551), delivery permit (Form 7501a), a bill of lading and consular invoice. A form is now in quite general use, however, combining the entry, declaration, and re-delivery bond.

The consular invoice is made out by the shipper on special forms furnished by the American consular officers, the shipper being required to certify to the truth of statements contained in the invoice before the consular officer at the place of manufacture or sale. Copies of this invoice are forwarded to the importer for use in making the customs entry.

PROCEDURE

Normal.—When the entry is presented at the Customhouse, an entry clerk examines it to determine if it is complete and properly executed. He then checks up the calculations and makes an estimate of duties to be paid, which the importer deposits. The delivery permit, stamped to indicate that the duties have been paid, is then given the importer, which, on presentation on the pier, authorizes the inspector to deliver certain packages to the importer and certain other packages, indicated on the permit, to the Appraiser's Stores for examination and appraisement. An examiner at the Appraiser's Stores examines the merchandise and approves the entered values or advances them, if he believes them to be too low.

While the determination of the rate of duty to be paid is a function of the Collector, an advisory classification of the merchandise is made at the Appraiser's Stores. If no irregularities are discovered, the importer is notified to call for his packages. If irregularities are discovered in the examination of packages, the examiner may call on the importer for the re-delivery of the balance of the importation, which have been removed from the pier on the delivery permit, which re-delivery the importer is bound to make under the terms of his re-delivery bond, so-called. After the work at the Appraiser's Stores has been completed, the papers are returned to the Collector, where the duties owing to the Government are computed. This is known as liquidation of the entry. If the liquidated duties are less than the estimated duties which have been deposited, the difference is refunded to the importer, and if the liquidated duties are higher, the importer is called on for an additional deposit.

Appeals.—If the importer is dissatisfied with the appraisement, he may, by appeal, secure a review by the Board of General Appraisers of

the appraiser's decision (Sec. 501, Tariff Act 1922). Likewise, a review by the Board of General Appraisers and Court of Customs Appeals of decisions of the Collector may be obtained by the filing of a timely protest (Sec. 514, Tariff Act 1922).

Automobiles and other vehicles arriving in the United States from Canada and Mexico are required to report without delay to the Customs officer or Customhouse nearest the place of such arrival. Failure to report subjects the offender to a fine of $100 (Sec. 459, Tariff Act 1922).

Awards for Information.—The Secretary of the Treasury is authorized to pay an award to any person, other than a Government officer, furnishing information to a Customs officer regarding a violation or contemplated violation of the customs laws, which information leads to a recovery of duties, penalties or fines, the amount of such award to be 25 per cent of the net amount recovered, but not to exceed $50,000 (Sec. 619, Tariff Act 1922). In the year 1928, approximately $600,000 was recovered by the Government as a result of information furnished under this provision of law.

Customs Regulations. — Information in detail regarding customs procedure may be found in "Customs Regulations 1923," a 792 page document on sale by the Superintendent of Documents, Government Printing Office, Washington, D. C. The various phases of customs work are conveniently segregated in the thirty chapters of this publication.

STATISTICS

Collections.—In the year 1914, the port of New York collected 68% of the total customs receipts of the United States. This percentage in 1922 was 63%; in 1923, 57%; in 1924, 58%; in 1925, 55%; in 1926, 55%; in 1927, 54%; and in 1928, 57½. As this indicates, the greatest increases in customs collections have been at ports other than New York.

Tabulated Transactions.—The following condensed table of customs transactions indicates the progress of the service:

	1921	1922	1923	1924	1925	1926	1927	1928
Consumption Entries:								
Free	217,053	182,267	209,778	206,154	209,319	226,382	246,257	246,577
Dutiable	261,094	310,722	389,511	416,449	428,989	459,726	486,274	495,695
Informal Entries	110,758	120,231	145,151	164,102	182,505	196,036	209,002	214,777
Mail Entries	409,286	508,590	560,498	838,773	742,917	768,811	786,683	825,925
Baggage Declarations	287,108	234,470	284,644	339,541	340,685	383,607	392,128	400,894
Drawback Entries	13,455	15,153	11,021	13,971	21.477	24,388	25,230	26,950

THE UNITED STATES TARIFF COMMISSION

By Thomas O. Marvin

Chairman, United States Tariff Commission

ACTIVITIES UNDER THE TARIFF ACT

Revision of Information Surveys.—From 1920 to 1922, the Commission published several hundred tariff information surveys concerning the commodities under consideration by the Ways and Means Committee of the House of Representatives, and the Finance Committee of the Senate, in drafting the Tariff Act of 1922. Because of the changes in industrial conditions since these surveys were published, the Commission is undertaking a detailed revision of them. In some instances the revisions take the form of bringing to date production, import, export, price, and other statistics for particular commodities, and in other cases the surveys are largely rewritten because of new developments in the industries. Some of these revised surveys will be published as funds become available, but most of them will be held in the files of the Commission, and kept currently up-to-date, ready to be published upon

short notice in connection with future legislation.

Flexible Provisions of the Tariff.—Under Section 315 of the present Tariff Act, the President may change existing rates of duty within upper or lower limits of 50 per cent of the present duty, if an investigation by the Tariff Commission of the difference in the cost of producing the article in question in the United States and in the principal competing country discloses that such a change is warranted. The most important investigations conducted under this provision of the law during the year 1928, from the point of view of time and expense, have been under the Ceramics Schedule (Schedule 2), and the Agricultural Schedule (Schedule 7), of the Tariff Act. Important subjects under investigation in the Ceramics Schedule have been Plate Glass, Window Glass, and Blown Glass Tableware.

Plate Glass.—The Plate Glass investigation was completed during the summer of 1928, and a report prepared embodying the results of a cost study in the United States and in Belgium, the principal competing country, covering practically the entire output of plate glass in the United States and in Belgium. Through the friendly coöperation of the Belgian producers, detailed cost data were obtained by representatives of the Commission directly from the cost records of the Belgian producers. Similar data had previously been obtained from the records of the American producers. In recent years, the domestic production of plate glass has been about 120,000,000 square feet, and imports have been from 15,000,000 to 20,000,000 square feet, annually.

Window Glass.—An investigation has also been in progress in the United States and in Belgium concerning plain window glass. Cost data were obtained in the two countries by similar methods and in similar detail to those obtained for plate glass, and a public hearing was held on August 7, 1928. The domestic production of window glass has been about 600,000,000 pounds, and imports about 80,000,000 pounds annually in recent years.

Blown Glass Tableware.—An unusually difficult investigation undertaken by the Commission from the point of view of obtaining comparable and representative cost data is that of blown glass tableware. Unlike plate glass and window glass, glass tableware manufactures do not produce a homogeneous bulk product, and costs must be obtained by the representative sampling method for both domestic and imported wares. After careful selection of comparable samples of foreign and domestic tableware, costs were obtained for these samples from most of the important domestic producers of blown glass tableware. This work required several months. Cost data from foreign countries have not yet been obtained.

AGRICULTURAL PRODUCTS

Corn.—Many products in the Agricultural Schedule have been under consideration during the past year. The most important of these are corn, milk and cream, peanuts, flaxseed, onions, potatoes, and tomatoes. The Commission obtained about 375 farm cost schedules for the production of corn in the United States, 27 elevator cost schedules, and tabulated the invoice prices and other data from customs invoices representing the bulk of the imports at both the Pacific and Atlantic ports. A public hearing was held on June 28, 1928, and the report has been completed.

Milk and Cream.—In the milk and cream investigation, about 900 farm cost schedules were obtained in the United States, and about 200 in Canada. In addition, 77 creamery schedules were obtained in the United States and 22 in Canada. The data have been tabulated, a public hearing held, and a final report is being prepared. Imports of milk and cream come into the United States principally from eastern Canada, and go to the consuming centers in New England and New York. These imports compete with the domestic milk produced in these areas, and to some extent with cream shipped from western sources of supply, such as Wis-

consin. In 1926, imports of milk were about 7,386,000 gallons and of cream about 5,374,000 gallons.

Peanuts.—The commission's investigation of peanuts covered the Virginia type, produced principally in Virginia and North Carolina, and the Spanish type of peanuts produced in Georgia, Alabama, Florida, and Texas. About 225 farm cost records were obtained for the United States. Cost data were also obtained in China by the Commission's representatives for peanut milling operations for about 50,000,000 pounds of nuts in 1925. Invoice prices and other data were also tabulated for imports into the United States during recent years. In 1927, imports from China of peanuts consisted of about 37,000,000 pounds of shelled nuts, and 4,000,000 pounds of unshelled. The total farm production in 1927 was about 867,000,000 pounds of peanuts in the shell, of which about 350,000,000 pounds were of the Virginia variety. The imports are more directly competitive with the Virginia type of nuts than with the Spanish type.

Flaxseed and Linseed Oil.—The commission has conducted investigations respecting flaxseed and linseed oil. About 325 cost records were obtained from farmers growing flaxseed in the principal producing areas of the United States, and from 40 coöperative elevators. Invoice data have been tabulated for flaxseed imported from Argentina. In the linseed oil investigation, costs of production data were obtained for 86,000,000 gallons in the United States, representing about 85 per cent of the domestic production, and through the friendly coöperation of the English producers, for 23,000,000 gallons in England, representing about 70 per cent of the production in that country. Hearings were held on flaxseed and linseed oil in December, 1928.

Onions.—The Commission's report on onions has been recently completed. About 800 farm cost records were obtained from the principal producing onion areas in the United States, including Texas, California, Washington, Idaho, Utah, Indiana, New York, and Massachusetts. As evidence of foreign costs of production, invoice price and other data were tabulated, covering imports from Spain, the principal competing country. There are imported annually from 50,000,000 to 75,000,000 pounds of onions from Spain, and about 25,000,000 to 50,000,000 pounds from Egypt. The Spanish onions are of the large, mild type, physically comparable with domestic Spanish onions produced in the western portion of the country, and to a slightly less extent with the domestic Bermuda onions. Egyptian onions are of the strong variety, and are imported chiefly in the early spring, after the domestic types are largely off the market.

Potatoes.—In the Commission's investigation of potatoes about 200 farm cost records were obtained in the United States, and 225 in Canada. In recent years, about 95 per cent of the imports of potatoes which have totaled 1,500,000 to 3,500,000 pounds yearly, have come from Canada. Potatoes imported from Canada are of two types; the certified seed potatoes, and the ordinary table stock. It is estimated that, in 1927, 25 per cent of the imports of potatoes from that country were certified seed, and the remainder table stock. These imports compete directly with the similar types produced in Aroostook County, Maine, and with potatoes produced in the states of New York and Michigan. The cost data obtained in the field are now in process of tabulation.

Tomatoes.—The Commission has in progress two independent investigations concerning tomatoes,—fresh tomatoes, canned tomatoes and tomato paste. The fresh tomatoes covered by the Commission's investigation are produced in Florida, Mississippi, and Texas, and marketed during the winter and spring. Comparable imported fresh tomatoes come from Mexico, Cuba, and the Bahamas. Imports of the early type fresh tomatoes in recent years have averaged about 5,000 carloads annually, compared with a domestic production of about 15,000 carloads. Canned tomatoes are imported principally from Italy. These imports, during the present tariff act, have increased greatly and

in 1927 totaled 92,400,000 pounds. The imported tomatoes bring a higher price than the ordinary grades of domestic canned tomatoes, and special problems have arisen in connection with the comparability of Italian tomatoes with the grades of domestic tomatoes. Cost data were obtained in the United States in the canning centers of California, Utah, Indiana, New York, New Jersey, and Maryland. Tomato paste is also under investigation in addition to canned tomatoes.

APPLICATIONS, INVESTIGATIONS, AND PROCLAMATIONS

Since the passage of the tariff act of 1922, the Commission has received applications affecting 357 commodities, investigations have been instituted covering approximately 80 commodities, and proclamations have been issued by the President covering 28 subjects. Tabulations of applications received, of investigations instituted, and proclamations issued, are shown below:

APPLICATIONS FOR CHANGES IN RATES OF DUTY

September, 1922-November, 1928

(Some commodities are the subject of more than one application)

Schedule	Number of Commodities Upon Which Applications Have Been Received	Number of Applications Looking Towards		
		Increase	Decrease	Adjustment of Duties
1. Chemicals, oils and paints	71	45	62	2
2. Earths, earthenware and glassware	32	27	14	1
3. Metals, and manufactures	59	52	16	4
4. Wood, and manufactures	15	15	7	0
5. Sugar, molasses and manufactures	6	1	6	0
6. Agricultural products and provisions	74	110	156 [1]	1
7. Cotton manufacturers	15	11	4	4
8. Flax, hemp, jute and manufactures	6	6	2	0
9. Wool and manufactures	12	9	4	3
10. Silk and silk goods	7	1	6	0
11. Papers and books	11	6	5	0
12. Sundries	45	24	30	4
Free	4	3	1	0
Total	357	310	313	19

[1] Includes 119 applications for a decrease in the rate of duty upon game birds.

INVESTIGATIONS ORDERED

September, 1922-November, 1928

Schedule	Number of Investigations
1. Chemicals, oils and paints	26
2. Earths, earthenware and glassware	8
3. Metals, and manufactures	7
4. Wood, and manufactures	4
5. Sugar, molasses, and manufactures	3
6. Agricultural products and provisions	20
7. Cotton manufactures	5
8. Flax, hemp, or jute, and manufactures	1
9. Wool, and manufactures	1
10. Papers and books	1
11. Sundries	7
Total	83

PERSONNEL OF THE COMMISSION

Commissioner Marvin was again designated Chairman of the Commission for a term of one year beginning January 15, 1928, and Commissioner Dennis was again designated Vice Chairman for a term of one year beginning July 22, 1928.

Commissioner Edward P. Costigan, who was appointed by President Wilson on March 21, 1917, for the two-year term ended September 7, 1918, and reappointed on September 11, 1918, for the full term of twelve years, resigned on March 14, 1928.

Frank Clark of Florida was nominated a member of the Tariff Commission by President Coolidge, March 21, 1928, for the term ending September 7, 1930, and was confirmed April

11, 1928. Mr. Clark took the oath of office on April 12, 1928.

Commissioner Lowell, who was confirmed on March 1, 1927, for the unexpired term which ended September 7, 1928, was given a recess appointment by President Coolidge on June 11, 1928.

CHANGES IN RATES OF DUTY BY PRESIDENTIAL PROCLAMATION

Commodity	Date	Action Taken
	1924	
Wheat	Mar. 7	Increase from 30¢ to 42¢ per bushel of 60 pounds.
Wheat flour, semolina, crushed or cracked wheat and similar wheat products	Mar. 7	Increase from 78¢ to $1.04 per 100 pounds.
Bran, shorts and byproduct feeds	Mar. 7	Decrease from 15% to 7½% *ad valorem*.
Sodium nitrite	May 6	Increase from 3¢ to 4½¢ per pound.
Barium dioxide	May 19	Increase from 4¢ to 6¢ per pound.
Barbital	Nov. 14	Basis of duty changed from foreign to American selling price.
Oxalic acid	Dec. 29	Increase from 4¢ to 6¢ per pound.
	1925	
Potassium chlorate	Apr. 11	Increase from 1½¢ to 2¼¢ per pound.
Bob-white quail	Oct. 3	Decrease from 50¢ to 25¢ each.
Taximeters	Dec. 12	Increase to 27.1% *ad valorem* based on American selling price.
	1926	
Men's sewed straw hats	Feb. 12	If valued at $9.50 or less per dozen, increased from 60% *ad valorem* to 88% *ad valorem*.
Butter	Mar. 6	Increase from 8¢ to 12¢ per pound.
Print rollers	June 21	Increase from 60% *ad valorem* to 72% *ad valorem*.
Paint brush handles	Oct. 14	Decrease from 33⅓% *ad valorem* to 16⅔% *ad valorem*.
Methanol (methyl or wood alcohol)	Nov. 27	Increase from 12¢ to 18¢ per gallon.
	1927	
Gold leaf	Feb. 23	Increase from 55¢ to 82½¢ per 100 on leaves not exceeding in size 3⅜" x 3⅜" and on larger leaves in proportion.
Pig iron	Feb. 23	Increase from 75¢ per ton to $1.12 per ton.
Emmenthaler type Swiss cheese	June 8	Increase from 5¢ per pound but not less than 25% *ad valorem*, to 7½¢ per pound, but not less than 37½% *ad valorem*.
Cresylic acid	July 20	Decrease from 7¢ per pound, plus 40% *ad valorem* based on American selling price, to 3½% per pound, plus 20% *ad valorem*, based on American selling price.
Phenol	Oct. 31	Decrease from 7¢ per pound, plus 40% *ad valorem* based on American selling price, to 3½¢ per pound, plus 20% *ad valorem* based on American selling price.
Crude magnesite	Nov. 10	Increased from 5/16 of 1¢ per pound to 15/32 of 1¢ per pound.
Caustic calcined magnesite		Increased from 5/8 of 1¢ per pound to 15/16 of 1¢ per pound.
Cherries, sulphured or in brine, stemmed or pitted	Dec. 3	Increased from 2¢ per pound to 3¢ per pound.
	1928	
Rag rugs, cotton (hit-or-miss type)	Feb. 13	Increased—duty (35% *ad valorem*) transferred to American selling price.
Barium carbonate, precipitated	Mar. 26	Increase from 1¢ per pound to 1½¢ per pound.
Sodium silicofluoride	Aug. 31	Increase—duty (25% *ad valorem*) transferred to American selling price.
Fluorspar	Oct. 17	Increased from $5.60 per ton to $8.40 per ton on fluorspar containing not more than 93% of calcium fluoride.
Potassium permanganate	Nov. 16	Increased from 4¢ to 6¢ per pound.

THE EXPORT AND IMPORT BALANCE

By Ray Ovid Hall

Senior Economic Analyst, Department of Commerce

FOREIGN TRADE TRENDS

Favorable Balance.—American exports of merchandise have increased, slightly at least, every year since 1921, with the exception of 1926. Merchandise imports, on the other hand, have had more ups and downs; although they are now about two-thirds higher than the abnormally low figure for 1921. Principally as a result of fluctuating imports, the "favorable" trade balance, so traditional in our international economy, fluctuated during the years 1922 to 1927 inclusive, in round millions of dollars, as follows: 719, 375, 981, 683, 378 and 681. The trade balance for the first nine months of 1928 was $489,000,000. The figure for the full year is thus vaguely foreshadowed at about that for 1927, since none of our "unfavorable" monthly balances in the present century has occurred in the final trimester.

For more than ten years economists have predicted that the United States would have a long succession of unfavorable trade balances as soon as the income from its foreign investments should begin to exceed the volume of its new loans to foreigners. Few people realize that even in 1924—which had a favorable trade balance of nearly a billion ($981,000,000)—the yield from our private investments abroad, plus our War Debt receipts, was considerably more than our "net export of capital." Furthermore the very size of our 1928 trade balance would indicate that we are, today, farther away from the predicted era of constantly unfavorable trade balances than we were five years ago.

FOREIGN LOANS

Relation to Trade Balance.—The fickle relationship between our trade balance and our new loans abroad is best seen, perhaps, in comparing 1926 with 1923. The trade balances of those two years were almost exactly equal, $378,000,000 and $375,000,000 respectively. Persons believing in the steadfast subservience of the trade balance to the volume of new loans will expect to find that the amounts of foreign securities underwritten in the United States in those two years were about equal. There was, however, nothing resembling equality in the two amounts. In 1923 the amount was $496,000,000; in 1926 it was $1,319,000,000—a discrepancy of $823,000,000.

The foregoing facts prove something amiss in the assertion that, since our foreign loans are dollar credits, they cannot be used—by the outside world as a group—except in buying American goods. Clearly foreigners have not used their long-term funds exclusively for that purpose, whatever else they did with them.

Export of Capital.—In the first place it is useful to abandon the term "our new foreign loans" in favor of a sharper term, "our net export of long-term capital." This step is not simple, although its results can be simply expressed. The Department of Commerce, in its annual balance of payments, now compiles or estimates 15 different movements in long-term capital in and out of the country.

Taking 1927 for example, it was found that, although foreign capital issues underwritten in the United States totaled about $1,558,000,000, outside our customs area, our net export of capital was only about $671,000,000. While Americans were acquiring this seeming glut of foreign securities—and also "exporting" some $276,000,000 of new capital for direct investments abroad and for capital payments against American bonds held by foreigners—foreigners were busily thrusting capital back into the United States. First they sent us about $304,000,000 for bond-redemption and sinking-fund payments; of the 11,659,000 of foreign securi-

ties underwritten here from 1914 to 1927 inclusive, all but 5.8 per cent were bonds. In addition, some $208,000,000 of the new underwritings were kept here for the refunding of bonds held by Americans; and about $120,000,000 were deducted for underwriters' commissions and for securities whose issue-price here was below par. Last, there is sound ground for believing that some $531,000,000 of foreign funds came into the country to buy American securities and properties (investments in future American prosperity) or to buy back from us foreign bonds of high yield (investments in the improving credit of foreign nations).

Several of these capital-movement figures are net; there is such an enormous volume of international stock-market dealings that the gross figures are all but incredible. Why burden the analysis with, for example, the datum that in 1927 foreigners (largely Canadians) bought some $891,000,000 of American securities? Most of this gross movement was on short-term speculation, or for arbitrage operations. The net figure seems to have been about $250,000,000.

DOLLAR CHECKING ACCOUNTS

Foreign Purchases.—Despite the enormous deductions and "back-wash" in our gross foreign lending, it still appears that foreigners did receive, net, some 2,279,000,000 of American long-term capital during the four years ended with 1927. This annual average net export of $570,000,000 of American long-term capital is certainly not a trifle.

It is known, however, that during those four years the total increase of foreign deposits in American banks (rather, "the increase in the net short-term indebtedness of American banks to foreigners") was about $522,000,000. The present total of foreign short-term funds held in the United States is certainly above $2,000,000,000 and may be near $3,000,000,000. Practically all these funds have come here since the Armistice. Thus, of our total long-term foreign loans since the Armistice, probably $1,500,000,000 or $2,000,000,000 went to buy, not American merchandise, but American checking accounts. This was incident to what Dr. Max Winkler calls the "dollarization" of the world.

FOREIGN PURCHASES OF GOLD

In September, 1927, the United States began to export gold in a record-breaking volume. During the eleven months ended July 31, 1928, the net export of American gold was $576,000,000. Thereafter our international gold movement became very feeble, both gross and net. The central banks of England, France and Germany now hold more gold than in 1913. It would appear that during those eleven months practically all of our net long-term loans to foreigners promoted the export of gold (for central bank reserves abroad) rather than the export of American goods. Indeed, the latter was slightly less during that period than during the corresponding eleven months of 1926 and 1927.

STOCK MARKET SPECULATION

The outside world probably now has about all the dollar checking accounts that it needs—and about all the gold it needs. This being true, our future loans to foreigners are very likely to "promote" exports of American merchandise and to "detract from" American imports of merchandise—in a closer harmony with the "classical" theory than has prevailed in recent years. In other words, it is likely—if our new loans to foreigners should continue at their recent levels, and if there should be no radical changes in the other "invisibles"—that our favorable trade balance will again approach the billion mark in 1929.

The sudden rise in interest rates in the United States in the summer of 1928 (caused chiefly by stock-market speculation) virtually shut off our foreign underwriting for a time and may curtail it in the future. Besides, it is believed to have brought a large sum of foreign short-term funds into the United States. A sharp reaction in the New York stock market might release $2,000,000,000

now tied up in brokers' loans, might lower interest levels, and might start, not only a strong outward movement of foreign short-term funds, but also an accelerated outward movement of American long-term funds. The curious conclusion is thus suggested that the magnitude of our foreign trade balance in 1929 may depend very largely upon the trend of stock-market speculation in New York.

OTHER INVISIBLE IMPORTS AND EXPORTS

Any discussion of the effect of our foreign loans upon our foreign trade must be predicated upon "other things being equal." These "other things" include, beside gold shipments and the yield of previous investments, a host of invisible transactions; and all these transactions "promote" other balance-of-payment transactions, or "detract from" them, precisely as do loans and merchandise shipments.

In each of the four years ending with 1928, our tourist expenditures abroad have exceeded our net exports of capital and have closely rivaled the yield from our private investments abroad. In 1927 our tourist expenditures totaled about $770,000,000; and the 1928 statistics of American citizens departed from American seaports or crossing the Canadian frontier indicate that the 1928 figure will be around $900,000,000. Nothing valid is likely to be discovered in an analysis of trade balances and foreign loans based on a "two-cylinder" balance of payments. The numerous other invisible items cannot be ignored.

Last, it should be observed that the merchandise account itself is not necessarily even the chief balancing item in our international dealings. That account can be causal, and it can be passive—depending upon conditions. Perhaps it is as likely to shape the loan account, and some of the other accounts, as for the reverse to happen. The comparative price of American products may be as much affected by the domestic influence of efficiency in production as by the outside influences of international credit, international money levels, and foreign exchange rates.

CONDITIONS OF INTERNAL COMMERCE

By A. L. Bush

Bureau of Foreign and Domestic Commerce, Department of Commerce

INDUSTRIAL PRODUCTION

Record Volume of Commerce.—Considering that the political unrest which accompanies a Presidential election year is likely to be reflected more or less in business activity, the year 1928 can be credited with a particularly triumphant record of accomplishments in domestic business. The year closed with the volume of commerce larger than ever before.

The Automobile and Construction.—Reported production of industrial commodities not only showed a substantial increase as compared with 1927, but rose higher than the peak record of 1926. In contrast with the 1927 decrease, automobile production was greater in 1928 than in any preceding year, and there was also a decided increase in the number of construction contracts. The growth in these two industries is noteworthy as it advantageously affected numerous related industries by increasing the demand for products such as steel, cement and other building materials, rubber tires, and petroleum, and had a far-reaching effect on employment and various elements which tend to promote trade activity.

Minerals and Textiles.—A comparative summary for a selected list of important movements in internal commerce reveals for this year an increase from 1927 in other industries. Copper production rose steadily. Smelters and refineries reached a new high level in output. Unfilled steel orders throughout the year continued

higher than at similar periods in 1927. While total mill consumption of cotton and wool failed to compare favorably with the preceding year, increased activity was noticeable in recent months. Silk mill consumption shared in the general upward trend in industrial activity which was characteristic of 1928.

EMPLOYMENT AND WAGES

As might be expected from the record of increased industrial production, factory employment gained appreciably, and wages continued at a high level. In the railway industry, average earnings per hour for all classes of employees, for the months in 1928 for which a report was available, showed an increase over the same period in 1927 of 1.3 cents. The increase over 1927 in total land used for crops harvested in 1928 provided some additional employment, and the ever-growing demands from mercantile establishments, hotels, gasoline stations and other services, absorbed many workers. It is encouraging to note that the unemployment reported for the early part of 1926 was reduced during succeeding months to a minimum and that, following the settlement of labor disputes in the coal and textile industries, amicable relations existed in most sections of the labor field and the year 1929 will have inherited no labor conflicts of importance.

PRICES AND CREDIT

The Price Status.—There has been little change from last year in the general level of wholesale prices inasmuch as the moderate increase in some commodities more than offset the slight price decline in other groups. The absence of either a sharp decline or sudden upward movement in prices is another indication of commercial stability. The advance in prices to the producer on some farm products somewhat overbalanced recessions in other groups, consequently the average of farm prices remained approximately the same as for the preceding year. Of significance is the fact that prices on farm products at no time in 1928 dropped to the low point which marked the close of 1926 and the early months of 1927.

Credit Conditions.—Credit conditions have been unusual. The heavy outflow of gold in the late months of 1927 continued during the first part of 1928 and caused a reversal in the easy money situation that had prevailed for several years. The reduction in our gold stock, together with the pronounced activity of stock exchanges, resulted in a sharp rise in rates for call money and stock exchange time loans. The point of importance to note in retrospect is that, notwithstanding the situation presented, bank credit for commercial purposes has been in ample supply at rates only slightly higher than in 1927, and open-market rates for commercial paper have increased by only about one and one-half per cent during the year.

WHOLESALE AND RETAIL TRADE

Wholesale trade showed little change in volume from 1927 but there has been a conspicuous increase in sales through various type retail outlets. Comparable reports show a large increase in mail order sales and in most classes of chain stores. The advancement in the farmer's purchasing power undoubtedly has contributed to the upward trend in mail order distribution, though the large growth in both the mail order and chain store business can be partly attributed to the increase in the number of stores operated by firms reporting sales volume. Department stores also experienced noteworthy increase in sales as compared with 1927, and at the close of 1928 showed relatively small inventories.

PROGRESS IN SCIENTIFIC MARKETING

A combination of reports depicting a high level of production, an absence of over-large accumulations of stocks of commodities, and an upward trend in retail sales with no pronounced fluctuations in the price average, suggests the possibility that the growing tendency toward intensive study of scientific marketing, even at this early stage of its development,

has made some progress toward constructive cooperation among producers and distributors. Though the distributor is still generally regarded as a beginner—student, ranking far below the manufacturer in the science of business efficiency, there is some evidence of concerted effort on the part of wholesalers and retailers to uncover deficiencies and to effect remedies. The manufacturer, on the other hand, is finding that he cannot rely upon his record of relative efficiency for his success, which, when obtained, is the result of increasing study of the buying habits of a discerning public.

According to a recent survey, the majority of failures of those engaged in any phase of our domestic commerce can be attributed to "a lack of modern business knowledge." The fact that the inefficient can expect to eliminate themselves from business is but added testimony to our advancement in commerce. There are many illustrations, however, to show that prospects are bright for those who fully equip themselves to do business on either a large or small scale. The ever-growing demands made upon the Government for more detailed business statistics and the increasing number of trade associations, and other agencies engaged in commercial research, indicate a widespread recognition of the opportunities for progress through the constructive application of business statistics and market data.

RAILROADS

By R. H. Aishton

President, American Railway Association

FACILITIES

The general outline of the railroad system of this country, so arranged as to serve the transportation demands for the development of its resources, for the hauling of raw materials to manufacturing plants and for transporting to widespread communities the products of farms, factories and mines, was formed years ago. For the past quarter of a century there has been an intensive development of this railway system as the volume of commodities to be transported increased. The extension of lines has been confined for the most part to branches reaching out into new territories not adequately served.

Mileage.—The total operated mileage of all tracks of the railways of this country in 1926 was 421,341 miles. In 1927 the total operated mileage was 422,300 miles. The new mileage in 1926 was 1,005 miles. In 1927 the new mileage was 779 miles. Of this total mileage about 90 per cent is operated by Class I railways; namely, those roads whose operating revenues amount for each to a million dollars or more each year. These Class I roads handle over 90 per cent of the traffic and, due to their long hauls, earn about 96 per cent of the total revenues.

Cars and Locomotives.—In the service of the Class I railways in 1926 were 54,773 passenger train cars; in 1927 the number was 53,804. The number of locomotives in service on Class I railways in 1926 was 62,761; in 1927, there were 61,317. The average tractive power per steam locomotive was 41,886 pounds in 1926 and 42,803 in 1927. From 1911 to 1927 the average tractive power per steam locomotive has been increased by more than one-half,—from 28,305 pounds to 42,803 pounds.

The number of freight carrying cars in service on Class I railways was 2,348,679 in 1926 and 2,324,101 in 1927. For several years there has been a continued increase in the average carrying capacity of freight cars. In 1911, for instance, the average carrying capacity per car was 36.9 tons. This average had risen by 1926 to 45.1 tons and in 1927 to 45.5 tons. This increase in average carrying ca-

pacity per freight car in seven years is 8.6 tons, or 23 per cent.

FINANCES

Improvements.—From 1922 to 1927 the Class I railways of the country spent $4,767,994,000 for improvements and betterments. Of this amount the sum of $2,419,577,000 was spent for equipment and $2,348,417,000 for roadway and structures.

The total property investment in road and equipment of the Class I railways, excluding switching and terminal companies, was $23,202,912,213 in 1926 and $23,798,269,022 in 1927.

Employees.—The number of employees on these Class I carriers was 1,779,275 in 1926 and 1,734,470 in 1927. The total amount paid in compensation to these employees in 1926 was $2,946,114,354 and in 1927 was $2,909,217,453. The average compensation per hour for each employee was $0.631 in 1926 and $0.644 in 1927. The average annual earnings in 1927 was about $1700.

Capital.—The total amount of railway securities, stocks and bonds outstanding in the hands of the public, exclusive of railway securities held by railways, is as follows:

Year	Capital Stock	Funded Debt	Total Capital
1925	$6,885,437,186	$11,305,076,143	$18,190,513,329
1926	6,830,464,432	11,403,847,205	18,234,311,637

It will thus be seen that in 1926 the American steam railways were capitalized at $74,398 per mile of road.

TRAFFIC

Freight.—The total freight revenue received by Class I railways, excluding switching and terminal companies, was $4,797,780,122 in 1926 and $4,630,713,035 in 1927. The average receipts per ton mile in 1926 were 1.081 cents and in 1927 were 1.080 cents. The average length of haul on revenue freight in 1926 was 179.99 miles and in 1927 it was 181.47. The total revenue tons carried by Class I railways in 1926 were 2,465,368,606 and in 1927 were 2,361,941,419. The revenue ton miles of these carriers in 1926 were 443,746,487,348 and in 1927 were 428,621,433,915. Car loadings of revenue freight were 53,098,819 in 1926 and 51,714,302 in 1927.

Passenger.—The total passenger revenues of Class I railways, excluding switching and terminal companies, were $1,041,816,167 in 1926 and $974,893,366 in 1927. The average revenue received from each passenger in 1926 was $1.21 and in 1927 it was $1.17. The average journey per passenger was 41.14 miles in 1926 and 40.55 miles in 1927.

The peak of passenger travel occurred in 1920, when the total number of passengers carried by Class I railways was 1,234,862,048. Since that time there has been a substantial decline both in the number of passengers and in passenger revenues. In 1926 the total number of passengers carried by Class I railways was 862,361,333 and in 1927 the total number of passengers carried was 829,845,522. A decline in 1927 of 28 per cent in passenger miles is indicated, from the peak of 1920.

Service.—The record breaking traffic of 1926 was handled by the railroads without substantial shortage and to the general satisfaction of all shippers. The same high level of dependable and adequate service has been maintained by the railroads in 1927 and in 1928. Adequate transportation facilities have been afforded to practically every shipper in the country.

During the first half of 1928 there was a decline in demand for transportation service on the railroads of the country from that of the previous year. In the second half of 1928, however, there was a substantial increase in this demand, due to a great volume of grain flowing from the wheatfields of the Southwest, the Middle West and the Northwest. This flow of grain became a sudden deluge, due to the greatly extended use of the combined harvester and threshing machines which were much more ex-

tensively utilized in 1928 than in previous years. An increase was noted also in the movement of coal, and a continuation in the movement of ore to the steel mills of the country. At the same time came a demand for refrigerator service in the far west to meet the needs of fruit growers and particularly the growers of grapes. Due to these concentrated demands the abilities of the railroads to serve the public adequately were put to a severe test, but the condition was met without serious consequence to any industry in the country.

Despite the decrease in passenger revenues, the railroads have maintained a high grade of excellent passenger service. Some of the carriers have been able to discontinue operation of certain unprofitable passenger service trains caused by the keen competition by motor vehicles on improved highways.

REVENUES AND EXPENSES

Operating Revenues.—The total operating revenues of Class I railways, excluding switching and terminal companies, was $6,382,939,546 in 1926 and $6,134,537,524 in 1927. For the first eight months of 1928 the total operating revenues of Class I railways, including switching and terminal companies, were $3,978,125,944, or a decrease of 2.8 per cent from the first eight months of 1927.

Operating Expenses.—The total operating expenses of Class I railways, excluding switching and terminal companies for 1926 were $4,669,336,736 and $4,572,632,285 for 1927. For the first 8 months of 1928 the total operating expenses of Class I railways, including switching and terminal companies, were $2,965,395,698, or a decrease of four per cent from the total operating expenses of the first eight months of 1927.

Net Income.—The net railway operating income for Class I railways, excluding switching and terminal companies, was $1,213,089,966 in 1926 and $1,067,915,340 in 1927. This income represented a return on investment in 1926 of 4.99 per cent and in 1927 of 4.30 per cent. For the first eight months of 1928 the net railway operating income of Class I railways, including switching and terminal companies, was $685,652,013, representing an increase over the first eight months of 1927 of 1.3 per cent.

Operating Ratio.—The operating ratio for Class I railways, excluding switching and terminal companies, was 73.15 in 1926 and 74.54 in 1927. For the first eight months of 1928 the operating ratio of Class I railways, including switching and terminal companies, was 74.54 as compared with 75.46 for the same period in 1927.

Taxes.—The railway tax accruals for Class I railways, excluding switching and terminal companies, for 1926 were $388,922,856 and for 1927 were $376,090,250. The amount of taxes paid by these carriers to the United States government was $109,817,494 in 1926 and $86,031,118 in 1927.

PURCHASES

In 1927, the railroads spent $1,396,000,000 for materials and supplies and $772,000,000 for new equipment and additions and betterments. This is an outlay equivalent to $78.60 for every family in the United States. The railroads spent $439,000,000 for coal alone in 1927. They consume approximately 25 per cent of the total amount of coal produced annually. The carriers also spent in 1927 about $433,000,000 for iron and steel products and purchased approximately one-fifth of the entire amount produced. The railroads' purchases of forest products amounted in 1927 to $176,000,000.

More than 150 plants employ over 60,000 wage earners that are engaged in building locomotives and cars for railway use. In addition, many other plants are engaged in the manufacture of railway supplies. Taken as a whole, the railroads are probably the largest single purchaser in the country.

PERFORMANCE

Freight Carriage.—In 1927 the Class I railroads of the country, excluding switching and terminal companies, originated over 113,000,000 tons of the products of agriculture,

approximately 26,000,000 tons of animals and animal products, more than 713,000,000 tons of the products of mines, approximately 100,000,000 tons of forest products, 291,000,000 tons of manufactures and miscellaneous goods and approximately 38,500,000 tons of merchandise and l.c.l. freight. The total tons originating on the roads in this group of carriers in 1927 was 1,281,064,954.

In 1927, an average of 16.1 per cent of freight locomotives on the lines of the Class I railways were in bad order. In the same year, 5.9 per cent of the freight cars on the lines of these carriers were awaiting repairs. Each freight car of the Class I railways traveled on an average of 30.3 miles per day, which marked an increase of 21 per cent over the performance in 1920. Each freight car on the lines of these carriers performed each day on an average in 1927 a service equal to carrying 518 tons of freight for a distance of one mile. The average freight train in 1927 consisted of 47 cars, and on the average each freight train carried 778 tons. The average freight train speed, counting all stops, on the Class I railroads in 1927 was 12.3 miles per hour.

RATES

Adjustments.—There were no major changes in freight charges during the year 1927. Numerous minor adjustments, mostly downward, however, were made in that period. Among the most important changes was the reduction of freight rates on California fruit moving eastward.

Investigations. — The Interstate Commerce Commission continued during the year its investigation of the rate structures in the various regions under the provisions of the Hoch-Smith Resolution. This nation-wide investigation of the rate system has been tied up with many pending cases, such as the investigation of class rates in the Eastern, Southern and Western regions and the Lake Cargo Coal rates, on which a decision was rendered during the year. The formal hearings under the provisions of this Resolution have been completed and a voluminous amount of evidence equal to more than 100,000 pages has been taken by the Commission in these cases, without including exhibits.

COMPETITION

Motors.—The more recently developed competitors of the rail carriers, such as the motor vehicle, the inland water transportation service and the airplane, have continued. In 1926 there were 21,908 bus operating companies and in 1927, 22,611. These companies operated 79,806 buses in 1926 and 85,636 in 1927. The miles of bus route operated were 607,293 in 1926 and 635,609 in 1927. It is estimated that these buses carried 2,395,000,000 passengers during the year 1926 and 2,525,000,000 passengers during 1927. The number of motor trucks registered in 1926 was 2,764,222. In 1927 the number of trucks registered was 2,896,886. The total number of passenger cars registered in 1926 was 19,237,171. The number had increased in 1927 to 20,230,429. The total mileage of surfaced highways in 1927 was 575,000 miles. The total certified mileage of highways in the country was 2,887,928.

Railroads and Motor Trucks.—Fifty-nine railroads are now using the motor truck either directly or through subsidiaries or contracts. Forty-seven employ these trucks for terminal operations, thirteen for store-door delivery and seventeen to replace local freight trains. Sixty-seven steam railroads use motor buses directly through subsidiaries or under contract.

Barge Lines.—The Inland Waterways Corporation, which is a government owned, subsidized and operated barge line, has extended its service from St. Louis to the Twin Cities. There has been an increase in the tonnage handled by this government barge line during the past year.

Air Mail Routes.—Many new air mail routes have been established during the year, with an increase in the amount of mail and express handled by airplane. An interesting event has been the coördination of passenger service by airplane and rail carrier.

Such routes have been established from New York to the Pacific Coast and to the Twin Cities.

REGULATION

Legislation.—No important Federal legislation was enacted with respect to the regulation of rail carriers during the past year. The bill known as the Parker Bill, an enabling act permitting voluntary consolidation of rail carriers upon the certificate of the Interstate Commerce Commission that such consolidation would be in the public interest, failed to come to a vote in the last session of Congress. It remains on the calendar for the succeeding session. Hearings were held before a Congressional committee on a bill to regulate interstate commerce by motor vehicle. No action, however, was taken upon this measure at the first session of the Seventieth Congress.

Relation to Waterways.—A bill was enacted into law known as the Denison Bill, authorizing an increase of $10,000,000 in the capitalization of the Inland Waterways Corporation, granting permission under certain conditions for the extension of its service to all tributaries of the Mississippi River except the Ohio, and directing the Interstate Commerce Commission, after granting a certificate of convenience and necessity to common carriers by water, including the Inland Waterways Corporation, to establish through routes, joint rates, differentials and divisions of rates between such common carriers and all connecting common carriers and their connections. Hearings were held before the Interstate Commerce Commission on October 12, 1928, for the purpose of discussing the meaning of this Act and the way in which it should be administered. The Inland Waterways Corporation has petitioned the Commission for a certificate of convenience and necessity, in which petition was set forth the desired through routes and joint rates and differentials.

VALUATION

The question with respect to the true principles of valuing railroad property, which has been referred to the Supreme Court of the United States in the O'Fallon case, has not yet been heard. It is the present understanding that this case will come up at the January, 1929 term of the Supreme Court.

Meanwhile, the Commission has continued its work under the LaFollette Valuation Act and has requested such information from the carriers as will, in its opinion, enable it to bring the valuations up to December 31, 1927.

HIGHWAYS AND MOTOR ROADS

By Thomas H. MacDonald

Chief of the Bureau of Public Roads, Department of Agriculture

MILEAGE

Rural Roads.—According to the best available estimates there were 3,013,584 miles of public roads in the United States on January 1, 1928. This mileage includes roads of all classes outside the limits of municipalities, and is made up in very large part of local roads of small importance, many of them mere right-of-ways established by law in the States of the Middle West on each section line.

The roads which accommodate by far the greater part of the rapidly-growing traffic of motor vehicles are comparatively limited in mileage and, in the main, are included in the Federal-aid or state highway systems, although the more important county and local roads, especially in metropolitan areas, also accommodate a very considerable and growing traffic.

FEDERAL AID

The Federal-aid system which includes, as a whole, the roads of highest traffic importance was designated

jointly by the Federal and state highway authorities following the passage of the Federal Highway Act in 1921. This system, which is limited by law to 7 per cent of the total highway mileage of record at the time the law was enacted, now includes 187,753 miles, a mileage which may be increased under provisions of the law to approximately 200,000 miles by future designations.

In most instances, the roads selected for inclusion in the Federal-aid system have also been designated by the states as units in the several state highway systems, but these latter systems are the more extensive, including, in addition to the Federal-aid sections, others which are not included in the Federal scheme. In the aggregate, these systems of the states included 293,353 miles on January 1, 1928.

All roads not included in one or the other of the foregoing main systems are county or local roads, and with few exceptions are of less importance than Federal-aid and state roads. The mileage of roads of this general class on January 1, 1928, was approximately 2,720,000 miles.

Status of Road Improvement.—All roads included in the Federal-aid highway system are eligible for improvement with Federal monetary aid. The improvement is carried out under the immediate direction of state highway departments subject to the approval of the Federal Bureau of Public Roads, acting for the Secretary of Agriculture, who is charged with the administration of the Federal Highway Act, and any amount not exceeding 50 per cent of the cost, or $15,000 per mile, may be paid by the Federal Government.

On December 1, 1928, the roads of this system which had been improved with Federal assistance reached a total of 74,653 miles, and on the same date other roads aggregating 10,090 miles were under construction, and 2,151 miles had been approved for construction in the immediate future, making a total of 86,894 miles already improved or in course of improvement with Federal aid.

As roads included in the Federal-aid system are also improved by the states without Federal assistance, and as the mileage thus improved is approximately equal to that jointly financed, the improved portions of this, our major highway system, now exceed three-fourths of the total designated mileage, and approximately 60 per cent of the entire mileage is surfaced with materials varying, according to the needs of traffic, from mixtures of sand and clay constituting so-called sand-clay surfaces to the most durable types of pavements.

STATE SYSTEMS

The state highway systems which, as previously stated, are coincident with, but more extensive than the Federal system, are improved as a whole, to nearly the same degree. On January 1, 1928, the total of 293,353 miles then embraced in these systems included 29,970 miles improved by grading and draining, and 176,566 miles of surfaced highways, the types of surfacing varying, as in the case of the Federal-aid system, from sand-clay to durable pavements.

The latest available statistics of county and local roads are those of January 1, 1928. On that date, as previously stated, there were approximately 2,720,000 miles of such roads, of which 412,155 miles or approximately 15 per cent were surfaced, and 477,979 miles were improved by grading and drainage only.

TYPES OF SURFACED ROADS

In each of the systems mentioned the surfaced roads are of various types, of which the principal are sand-clay, gravel, water-bound and bituminous macadam surfaces, and sheet asphalt, bituminous concrete, Portland cement concrete, and brick and other block pavements.

Of these several types, the sand-clay, gravel and water-bound macadam with the unsurfaced but graded and drained roads are frankly regarded as temporary or transitory, to be replaced by a more durable type when traffic reaches a sufficient volume to require and justify such replacement. The other types—bituminous macadam, sheet asphalt, bitu-

minous concrete, Portland cement concrete, and brick and other block payments—are classified as durable, and are suited to the needs of heavy motor traffic.

CLASSIFICATION

According to the latest available statistics for each of the three general highway systems previously mentioned, roads of the Federal-aid system are classified as 65 per cent temporary or transitory and 35 per cent durable; those of the state systems are similarly classified as 80 per cent transitory and 20 per cent durable; and a similar grouping of the county and local roads includes in the temporary classification all but one per cent of the total. This classification serves to indicate as accurately as is possible, perhaps, the relative degree of improvement of the three systems.

In the table below the total of 3,013,584 miles of road in the country, segregated as of the state and local systems, respectively (the former including the Federal-aid system), is classified by type of surface, as of January 1, 1928, the most recent date for which the complete statistics are available.

CLASSIFICATION OF HIGHWAYS BY TYPE
(as of January 1, 1928)

Type	State Highways Miles	Local Roads Miles	All Highways Miles
Unimproved and partly graded	86,816	1,830,097	1,916,913
Graded and drained	29,970	477,979	507,949
Sand-clay and top soil	12,581	71,770	84,351
Gravel, treated and untreated	86,095	263,088	349,183
Water-bound macadam, treated and untreated	17,752	45,500	63,252
Bituminous macadam	13,496	13,525	27,021
Sheet asphalt	1,332	1,454	2,786
Bituminous concrete	5,066	3,680	8,746
Portland cement concrete	36,915	11,438	48,353
Brick and other block pavements	3,330	1,700	5,030
Total	293,353	2,720,231	3,013,584

CONSTRUCTION MILEAGE

During the year 1927 there was a total of 86,454 miles of road built on the state and local road systems, of which the surfaced portions amounted to 53,424 miles. Of these totals, 26,722 miles, including 19,572 miles of surfaced roadways, have been constructed by the states with and without Federal aid, and 59,732 miles, of which 33,852 miles have been surfaced, have been built by the county and local governments. The Federal-aid road construction during the fiscal year ending June 30, 1928, totaled 11,508 miles including 8,092 miles of surfacing.

EXPENDITURES

Since 1921 the annual expenditures for all rural road construction and maintenance have exceeded a billion dollars, a large and increasing proportion of which is provided by the taxes levied on motor vehicles and motor fuel. Large as it is, this expenditure is only half of the annual expenditure by owners of motor vehicles for gasoline alone. In this fact there is a suggestion of the reason for the public approval and economic wisdom of the highway expenditures, since the money thus invested results in a reduction of the cost of gasoline and other operating expenses of motor vehicles which demonstrably exceeds the expenditure.

In 1927, the most recent year for which complete statistics are available, the expenditures of the state highway departments (including Federal aid) amounted to $699,875,182; those of the counties and other local governments were $748,245,735. These expenditures are classified according to their purpose as follows:

By State highway departments:	
Road and bridge construction	$400,038,378
Road and bridge maintenance	138,783,358
Interest and principal on bonds	65,073,771
Equipment and miscellaneous	95,979,675
Total	$699,875,182

By counties and other local governments:	
Road and bridge construction	$289,180,355
Road and bridge maintenance	237,970,467
Interest and principal on bonds	179,812,048
Miscellaneous purposes	41,282,865
Total	$748,245,735
Grand Total	$1,448,120,917

INCOME SOURCES

In the same year the taxes and other sources of income which supported the above listed expenditures were as follows:

STATE AND COUNTY INCOME

Source	Amount	Per Cent
State income:		
balance from preceding year	$182,714,171	19.8
Bonds	90,979,230	9.9
Highway taxes	18,769,561	2.0
Appropriations	30,794,645	3.3
Federal aid	80,459,671	8.7
Motor license fees	259,854,786	28.2
Gasoline taxes	169,818,473	18.4
Miscellaneous	89,108,892	9.7
Total	$922,499,429	100.0
County income:		
Balance from preceding year	$178,107,618	17.5
Bonds	181,080,953	17.8
Taxes and appropriations	477,912,511	46.8
Motor license fees	40,239,856	4.0
Gasoline taxes	46,860,508	4.6
Miscellaneous	94,520,095	9.3
Total	$1,018,721,541	100.0
Grand Total	$1,941,220,970	

USAGE OF ROADS BY MOTOR VEHICLES

During 1927, according to information received from the States, the consumption of gasoline by motor vehicles amounted to approximately 10,600,000,000 gallons, and it is estimated that the total for 1928 will exceed 13,000,000,000 gallons, which at 12 miles per gallon (the approximate average consumption by vehicles of all makes and types) would indicate that the annual travel by motor vehicles amounts at present to over 156 billion vehicle-miles, an almost inconceivable figure. Yet large as it is, it must be more than doubled to obtain a measure of the passenger-mileage for which the automobiles and improved roads and streets are responsible. This tremendous annual passenger movement by highway passed the rail movement some years ago and is now approximately 9 times as great.

UNITED STATES HIGHWAYS

Mileage and Routes.—Of special interest to all owners of motor vehicles is the network of principal interstate and transcontinental highways, known as United States highways, designated in 1925 by agreement between the highway authorities of all states and the Federal Government. There are approximately 98,000 miles of such highways comprising the most direct and feasible interstate and transcontinental connections, and a plan has been adopted and is being rapidly put into effect whereby the routes which compose this important network will be uniformly designated by numbers and clearly marked with warning and danger signs in all states.

In this system, which is made up of the most important sections of the Federal-aid and state systems, there are approximately 180 routes, and each route is being marked, throughout its entire length in all states traversed, by the same distinctive number, displayed on a white shield-shaped marker.

Road Numbers.—All east-and-west routes are being designated by even numbers, the more important in mul-

tiples of 10, as 10, 20, 30, etc. The north-and-south routes are being designated by odd numbers, and the more important of these roads are being indicated by two-digit numbers ending in one or five, as 11, 15, etc.

Warning Signs.—For the guidance of travelers, all of these routes are being marked with standard direction and warning signs, which are readily distinguishable by their shape and color as well as by the warning and information printed upon them, and they thus indicate at a glance the nature of the danger to be avoided or the character of the information they carry.

All danger and warning signs are composed of a yellow background with black lettering. They are made in four shapes indicative of different degrees of danger. Thus, an octagonal sign is used to give warning of such extreme danger as to require a complete stop. A round sign is posted at all railroad crossings. Diamond-shaped signs give notice of such dangerous conditions as curves, steep grades, narrow bridges, etc.; and square signs are posted at points of occasional danger such as approaches to schools, churches, hospitals, etc.

Information Signs.—All directional and information signs will be white with black lettering, and all will be rectangular in shape. Those calling attention to legal speed limits will be in the form of a vertical rectangle; all others will have their longer dimension horizontal.

These route markers and signs are now in the course of erection. In 28 states their placement has already been completed, and in another 12 states the work is from one-half to three-fourths completed. As rapidly as possible this important and useful work in the interest of safe and expeditious travel will be carried out in all states.

MOTOR BUS SERVICE

By Carl W. Stocks

Editor, *Bus Transportation*

STATISTICAL

Progress.—Transportation by motor bus throughout the United States is continuing to grow with remarkable rapidity. Economic progress is being made. Worth while city systems are being established through purchase and mergers of existing lines. Long-haul routes are gaining a firm foothold and are becoming increasingly popular with the public. The total taxes paid by both city and intercity motor carriers may be set at $16,000,000, or something more than 5 per cent of the gross revenue.

Bus Operation. — Approximately 92,000 buses are in operation since Jan. 1, 1929, compared with 86,000 in 1928, 80,000 in 1927, and 70,000 at the beginning of 1926. Slightly more than half of these 92,000 buses are employed in common carrier service, that is, are operated over regular routes on a definite schedule. Buses operated by electric railways or subsidiaries are now figured at approximately 9,000, while the steam railroads use over 1,000.

In the non-common carrier group, the large number of school buses indicated the movement toward consolidated schools. The number of buses employed to transport children between home and school now approximates 38,000.

Buses operating in cities carried 1,575,000,000 passengers in 1927, while those operating on intercity routes carried 635,000,000. City riders paid an average fare of 7.75 cents; intercity riders, 30 cents.

GROUPS

Common Carrier Groups.—Taken as a whole, the common carrier portion of the industry is gradually assembling itself into three broad groups: 1. local operations that center in or about a single city and largely under unified control; (2) intrastate operations, subdivided as follows: (a) intercity operations where

routes radiate from a given urban center but are not united by ownership or management, (b) intercity operations serving intensively under a single management,—substantially all routes radiating from a given urban area or group of cities; 3. long-haul operations, usually interstate and connecting large industrial or commercial centers.

Urban.—In the first-named group, covering local urban operations, a very definite tendency towards a limited form of monopoly of public transportation is to be noted. Not only bus operations, but the other forms of local common carrier transportation service, including in some instances taxicab operations, are being brought under one financial control. There are 82 cities in the United States with more than 100,000 population. Only 18 of these cities have bus systems operated by other than electric railway companies. This outstanding fact in itself in an indication of the changes taking place in the local transportation field.

In the handful of the million or more population class cities (including New York, Chicago, and Detroit), major bus operations continue in the hands of companies not controlled in common with the local railway companies, although in each of these cities the railways recently made a start in bus operation. In cities with a population of from one-quarter million to a million, major bus operations have passed into the same hands as those of the electric railways, except in St. Louis, Jersey City, and Cincinnati. The same trend is found in the majority of cities from 100,000 to 250,000 population. Independent bus companies are now found in but 10 of the group of 53 cities ranging in population from 100,000 to 250,000. The same tendency towards unified control of transportation facilities is found in smaller cities. In places under 100,000 population, where railways have ceased operation, it is common to find that buses have been substituted. So far buses have not supplanted any railway serving cities of more than 60,000 population.

Intercity operations may be divided into two groups. The first includes those that radiate from a common center; the second, those that cover a broad territory and operate a network of routes connecting more or less important centers. In the first mentioned group, there has been a tendency to consolidate the various lines and form larger and more efficient operating units. Generally speaking, consolidations have been consummated only where built from the inside; the more aggressive motor carriers acquiring a line or a single operation at a time.

Shoe String Lines.—Interstate and intrastate intercity lines have been combined also into single systems. Many of these consolidations are due to the belief that short "shoe string" intercity lines, merely connecting smaller communities with larger ones, do not offer the same opportunity as does a system with routes of 100 miles or more. Especially is this true where main lines can be established that connect several cities of considerable size with a naturally large interchange of traffic. Then, to this main-line system are added feeders or secondary routes connecting intermediate points with cities and towns at distances ranging from 20 to 25 miles.

LONG-HAUL INTERSTATE LINES

Regulation.—The long-haul field is the most recent to be entered by bus operators, under the negative ruling of the United States Supreme Court in the now famous Buck *vs.* Kuykendall decision. Within the past year (1928), this class of operation has had its greatest growth. The larger motor carriers have entered this phase of bus operation with determination, and their size and strength perhaps compensate for lack of regulation. Should any form of regulation be promulgated by Congress, these larger carriers believe that by being in existence, convenience of their services will have been established and they should all receive operating certificates when granted by the body assuming regulatory powers. As an indication of the public bus-mindedness, there are in-

stances where more traffic is being handled between some of the large urban centers by buses than by the long established rail lines.

Long Runs.—Four companies now offer through transportation by bus across the continent, either direct or by interline agreements. Another company covers fairly thoroughly the main north and south routes east of the Mississippi River through interline ticket arrangements with connecting lines at the more important centers. Further development is needed, but the interline ticket selling practice already makes it possible to travel by bus on a single ticket between practically any two important cities in the country. Night runs are increasing in popularity and are now almost universal on the longer routes. The riding public has indicated preference for continuous travel, often up to 1000 miles without change of vehicle, instead of making overnight stops as was heretofore done. These distances, however, mean a change of drivers each 200 to 500 miles.

TECHNIQUE

New Vehicle Designs. — Rapid strides have been made in the design of vehicles. Chassis parts are more rugged, engines are of greater horsepower, bodies have greater headroom. More comfortable seats with foot and head rests have appeared for long-haul travel, and toilet facilities are now considered a good advertisement for vehicles used for the longer runs. Interior fittings are less gaudy and greater attention is being given to their utility.

By no means has bus design stopped. Even with the many restrictions that have been placed upon the designers by state law or public service commission regulations, the inventive American mind is at work and new and approved designs are constantly being brought out. This was evidenced during the year by new models of larger capacity units for the heavier city lines and more comfortable fittings for day and night travel on the intercity runs.

A much better appreciation exists on the part of all classes of bus operators that much depends upon the mechanical condition in which buses are kept, even though buses are now maintained in better mechanical condition than at any time heretofore.

THE FUTURE

The tendency toward monopoly in city operation will continue, and as the larger single deck vehicles with 33 seats or more become better known, the cities that will be served by buses exclusively will increase both in number and size. In the larger cities, buses will develop a traffic of their own—first through coördination with other transportation agencies, and then through gradual expansion to reach into new territory routes. Ultimately, on account of greater flexibility, they will take over the transportation facilities made too costly with established rates of fare in many congested areas.

In the intercity field, buses will be found handling the greater portion of the short-haul traffic on the heavily traveled highways, which are a hindrance to the use of private automobiles. Long-haul traffic is going to increase for the simple reason that only a small proportion of people demand, or will pay for, speed of travel greater than can be safely accomplished by buses over the highways. Where this is the case, trains and airplanes are ready to serve.

URBAN AND INTERURBAN RAILWAYS

By Henry W. Blake

Senior Editor, *Electric Railway Journal*

STATISTICS

Statistics of the urban and interurban railways in the United States are compiled by the Census Department every five years. Preliminary figures for 1927 were made public in

October, 1928. They show a reduction from 1922 of 21 per cent in number of companies, 7 per cent in miles of line and number of cars and 2 per cent in passengers carried. The car miles operated show a 2 per cent increase. Below are the figures summarizing the industry:

SUMMARY FOR ELECTRIC-RAILWAY INDUSTRY: 1927, 1922 AND 1917

	1917	1922		1927 Totals of Reports Received Prior to Sept. 14, 1928
		As Originally Published Comparable with 1917	Adjusted for Comparison with 1927 *	
Total number of companies..	1,370	1,200	1,166	998
Operating	943	858	826	655
Lessor	364	342	340	343
Total number of employees...	294,826	300,523	292,624	†262,725
Number of bus employees (included in total above)	.....	404	400	7,168
Total miles of track operated	44,835.37	43,931.86	42,373.99	41,417.65
Miles of first track	32,547.58	31,264.26	30,070.34	27,865.70
Total number of cars (all types)	102,603	99,255	95,931	89,642
Total number of car-miles operated	2,139,801,530	2,138,281,674	2,081,085,455	2,120,774,257
Total number of car passengers	14,506,914,573	15,331,399,851	14,881,857,530	14,521,977,983
Number of revenue car passengers	11,304,660,462	12,666,557,734	12,335,286,642	11,802,916,612
Miles of bus route (round trip)	.....	685.36	683.86	‡13,031.34
Number of buses	.....	370	368	3,878
Total number of bus-miles ..	.....	7,116,404	7,100,624	130,015,315
Total number of bus passengers	.....	16,120,115	16,109,836	398,323,932
Number of revenue bus passengers	.....	12,791,308	12,783,202	325,919,601

* The figures given in this column are totals for those companies which made reports for 1927 prior to Sept. 14, 1928, and those which operated in 1922 but went out of existence as separate companies prior to Jan. 1, 1927.

The 1922 figures for the companies which are believed to have operated in 1927 but which had not submitted reports prior to Sept. 14, 1928, are as follows: Number of operating companies, 32; total number of employees, 7,899; number of bus employees, 4; total miles of track operated, 1,557.87; miles of first track, 1,193.92; total number of cars (all types), 3,324; total number of car-miles operated, 57,196,219; total number of car passengers, 449,542,321; number of revenue car passengers, 331,271,092; miles of bus route, 1.5; number of buses, 2; total number of bus-miles, 15,780; total number of bus passengers, 10,279; number of revenue bus passengers, 8,106.

† Not strictly comparable with 1922 because of the fact that some establishments which at the census for 1922 included data for power plants in their railway reports made separate power-plant reports for the year 1927.

‡ Not strictly comparable with 1922 because of the fact that the schedule for 1922 called for miles of bus lines, *one way*, whereas the 1927 schedule called for miles of route, *round trip*.

Abandonments.—While there have been some abandonments of railway properties between 1922 and 1927, particularly in the smaller cities and among the suburban roads, these figures show that the gain in business in the larger cities has been nearly enough to make up for the losses from abandonment. Electric railways are seeking to win back the patronage lost to the private automobile by installing more attractive and comfortable cars. Extensions of service are now generally made by buses.

ENGINEERING

Car Design.—The design of urban and interurban cars during the past year has tended to follow automobile lines in some features, even in those relating to appearance only, like the streamline method of painting. Correspondences in features more

closely connected with car operation are more general use of upholstered, and in some cases individual seats, means for more rapid acceleration and braking, increases in over-all speeds and decreases in car weight and in noise. Efforts to increase over-all speeds have included steps to reduce the time spent at car stops. During the year tests have been conducted with several experimental electric cars equipped with the automobile method of drive to electric cars, and four new designs have been brought out. No large orders have yet been placed for cars equipped with this type of drive. Aluminum in the form of some of its alloys has been used to a greater extent during the last two years in car body construction.

Articulated Trains.—Considerable progress has been made during the year in the use of articulated cars or trains, both for rapid transit and surface operation in cities. An articulated train consists of two or more car bodies permanently connected at adjoining ends by some kind of a vestibule and supported at this point by a single truck. A unit of this kind with two car bodies would have three trucks, with three car bodies it would have four trucks, etc. The pioneer in the use of such trains for rapid transit service was the Brooklyn Manhattan Transit Company, which now has about 120 of such units, each consisting of three car bodies mounted on four trucks. The first four units had motors mounted on the front and rear trucks only, but in the later equipments a motor is carried on each truck. The complete weight of such an articulated unit, as used in Brooklyn, is 150 tons. Surface railways in Milwaukee, Baltimore, Detroit and Montreal are also using a number of articulated trains, though usually made up of two much smaller and lighter car bodies, mounted on three trucks. Such trains are adapted only for lines with considerable traffic density.

RAPID TRANSIT

Philadelphia.—Operation of the Broad Street Subway in Philadelphia, which was built by the city and is about 6½ miles in length, was begun September 1, by the Philadelphia Rapid Transit Company on a 90-day arrangement. This contract provides that the company shall charge an 8¢ fare, with two tickets for 15¢, and that it shall give full transfer privileges between the subway and its other lines. The rental paid to the city is $200,000 a month, an amount said to be about half of the subway's carrying charges.

Detroit.—The experimental surface rapid transit line on Jefferson Avenue, Detroit, where surface electric cars operate in the center of the street, with stops averaging 0.83 miles apart, with free transfers to and from a local bus service on the same street, has been extended during the year. The express service is now given for a distance of 4½ miles. Results after a year of service indicate that only a small percentage of the passengers transfer between the car and bus and that the cost of operating the buses is considerably more than the saving made from the increased speed of the cars and the reduction in number of car stops. However, a much faster service is given between the down town section and the suburb reached, and the speed of all vehicles on Jefferson Ave. has been increased. This has increased the street capacity.

New York.—The most important rapid transit event in New York City was the effort made by the Interborough Rapid Transit Company to secure an increase in fare from five cents to seven cents. The company obtained a favorable decision on May 2 in the Federal Circuit Statutory Court. The case was then taken by appeal to the United States Supreme Court where, after a hearing, the date for re-argument was set for January 14, 1929.

Boston.—The period of control of the Boston Elevated Railway by trustees appointed by the Governor of Massachusetts, which was set in 1918 for ten years, expired on July 1, 1928. As no changes in the present arrangement were made by the Legislature, the contract continues in force.

It can now be terminated by the State only on two years' notice, after the necessary legislative action has been taken.

FUTURE OF ELECTRIC RAILWAYS

Electric railways still appear to be the most economical means of transportation where large numbers of people have to be carried over city streets, as well as the one most economical of street area. Where the passenger density is low, there is a field for the bus. The chief competitor of both the car and the bus is the private automobile, but as parking facilities in the shopping and business districts in the larger cities become more restricted, the public will have to travel to a greater extent by street cars. Other optimistic possibilities of the street car are greater gross earnings because of higher speed, and lower cost through more scientific operation and maintenance. Outside of a few cities, New York being one, the fare problem has become secondary in importance, through the grant of higher fares by the authorities.

THE MERCHANT MARINE

By Peter Bain

Editor, *Shipping Illustrated*

GOVERNMENT AND PRIVATE OWNERSHIP

Comparative Tonnages.—The generally expressed desire that private ownership ultimately possess and dominate the American Merchant Marine made fair progress towards realization in 1928. Government-owned tonnage controlled by the United States Shipping Board and its Fleet Corporation, as of July 1, 1928, decreased by 429,645 gross tons from July 1, 1927, for vessels of 1000 gross tons and over, while that of privately-owned tonnage had increased by 217,942 gross tons from July 1, 1927, for vessels of 500 gross tons and over. An analysis of ownership shows the Shipping Board as controlling 761 steel vessels of 4,110,061 gross tons of 1000 tons and over on July 1, 1928, compared with 879 steel vessels of 4,539,706 gross tons on July 1, 1927. Private ownership, on the other hand, was represented on July 1, 1928, by 1361 steel vessels of 6,351,377 gross tons and 573 wood vessels of 702,920 gross tons, all of 500 gross tons and over, compared with 1316 steel vessels of 6,057,612 gross tons and 641 wood vessels of 778,743 gross tons on July 1, 1927.

Foreign and Coasting Trade.—Of these totals on July 1, 1928, those in foreign trade numbered 1201 vessels of 6,161,871 gross tons and those in the coast trade 1494 vessels of 5,002,487 gross tons. American vessels participated in the carriage of our waterborne foreign trade to the extent of 33½ per cent of the total value in the year ended June 30, 1928, as compared with 34 per cent in the preceding year. Since June 1, 1927, when our foreign trade reached its greatest volume—10,699,596 gross tons—there has been a steady decline, until on June 1, 1928, it amounted to only 6,117,565 gross tons. The decrease is due principally to the scrapping of large vessels which belonged to the Shipping Board and to changes from foreign to coasting trade because of apparently greater opportunities in the latter service. Since June 1, 1921, the coasting trade, exclusive of the trade on the Great Lakes, has increased 2,558,041 gross tons. During the same seven years the total seagoing tonnage has decreased 1,979,684 gross tons.

Construction and Maintenance Figures.—The merchant marine of the United States—all documented craft—as of June 30, 1928, comprised 25,385 vessels of 16,683,061 gross tons, of which 2,336 seagoing vessels of 10,882,793 gross tons were of 1000 tons or over, compared with 2447 vessels of 11,071,918 gross tons on June 30,

1927. Idle shipping in the United States on June 30, 1928, totaled 3,039,000 gross tons and was 135,000 tons, or 4½ per cent, more than on the corresponding date of the previous year. This increase was more than accounted for in the larger tonnage of privately owned vessels laid up, viz. 161,000 tons. Idle Shipping Board tonnage, in contrast, diminished by 26,000 tons. During the year, 969 vessels of 257,180 gross tons were built and documented, and on July 1, 1928, there were building or under contract to build in our shipyards 483 vessels of 264,410 gross tons. The corresponding figures for 1927 were 882 vessels of 245,122 gross tons built and 280 vessels of 219,044 gross tons under contract to build. The new tonnage includes twelve steel passenger steamers of 75,258 gross tons, four steel cargo steamers of 32,228 gross tons, two steel tankers of 13,116 gross tons, and one ferry of 2767 gross tons, aggregating 123,369 gross tons, At this juncture, it should be pointed out that all new construction of American merchant shipping is under the management of private ownership, the government through its Shipping Board and Fleet Corporation having gone out of that department of the business following the Armistice in November, 1918.

Private Contract Tonnage.—On November 1, 1928, American shipyards were building or were under contract to build for private owners, 423 steel vessels of 223,566 gross tons and 83 wood vessels of 36,554 gross tons. While the prospects for new construction of a type more in line with the development of an up-to-date merchant marine are rather more promising than for some years past, it should be said that the figures quoted above disclose as yet no great change from individual months of both 1927 and 1928. Again, the number and tonnage of vessels in process of construction continue to show a preponderance of barges and other small craft for inland waterway and coastal service rather than vessels for service in world trade, commerce and travel.

JONES-WHITE MERCHANT MARINE LAW

Provisions and Significance.—Probably the most outstanding event of 1928 was the enactment of the Jones-White Bill; President Coolidge having affixed his signature to it on May 23. This measure authorizes a big replacement program, requires the sanction of but five of the seven members of the Shipping Board for the sale of vessels to private operators, doubles the existing $125,000,000 construction loan fund of the Board and liberalizes the ocean mail contract system. Shipowners, shipbuilders and kindred industry associates have been generous in their approval of the Bill, being assured that a long step forward has been taken and, therefore, a new era inaugurated, with the competitive handicaps relative to foreign shipping less formidable because of compensations made available. Increase of the construction loan fund with its far from onerous terms to shipowner-borrowers has materially increased the number of the latter and the amount of their requirements, and what is perhaps the more important aspect of the new position, is the spirit of enthusiasm that has been aroused in private ownership as evidenced by its desire to get back into world ocean services and participate in world trade.

Service and Construction Expansion.—To this end, more Shipping Board services have been purchased and already plans have been drawn and bids asked on a reasonably big new construction program, by a privately owned line trading on a regular schedule between this country and Europe. Satisfactory mail carrying contracts also have been apportioned in a number of cases. It will be appreciated, of course, that the shipbuilders, and the main and auxiliary engine-builders, and myriad other related industries begin to hum when the shipowner not only sees the necessity for adding to his fleet but finds opportunity beckoning and also serving him. Placement of mail carrying contracts for the most part stipulates new construction of fleet units at reasonably scheduled intervals of years,

constituting another direction from which the kindred industries benefit through the Jones-White Bill. Legislation of the past year has, however, affected more directly passenger liners, combination passenger and cargo liners and first-class cargo carriers rather than the more or less slow cargo carrier or "tramp," but even in the case of the latter, compensations are meantime available in some degree and hopes are entertained that when the welfare of our merchant marine again comes before the House, the Senate and the President these craft will receive the attention and consideration their national work and worth merit.

Legislative Outlook.—To get the Government out of the Shipping business is believed to be the fervent desire of nine out of every ten of our people, yet that day seems quite far off. Of course, private ownership is the officially declared and probable ultimate outcome. The United States Lines and the American Merchant Line are for sale by the Shipping Board and some keen bidding is expected for both by private operators. This is not the first occasion these two lines have been "on the block," and having regard to previous experience in the case of the former particularly, the present may hardly be the last. Both lines have a steadily improving record to their credit, and each has many prospective-owner admirers. The Government has operated the United States Lines since establishment, while the American Merchant Line has been on a managing operator basis.

COASTAL AND INTERCOASTAL SERVICE

New Ships and Features.—Coastal and intercoastal shipping has, as in previous years, registered not only a fair number of new entries into service, but has shown a strong tendency to increase the annual contribution, and to improve the type, size, powering, equipment and accommodations to the high standard maintained by the biggest and best of the North Atlantic express liners. The Panama-Pacific intercoastal liner *Virginia*, second of a fleet addition of three new vessels, the new Grace intercoastal liners *Santa Maria* and *Santa Barbara*, and the Southern Pacific coastal liner *Dixie* were the more prominent entries. The *Virginia*, sister ship to the *California* and featured in some detail in the 1926 and 1927 editions of THE AMERICAN YEAR BOOK, entered service on December 8. Just as the *California* and *Virginia* were epoch-making through the introduction of turbo-electric propulsion in our merchant marine, also holding the distinction of being the largest of any vessels yet constructed in an American shipyard, so the *Santa Maria* and *Santa Barbara* were epoch-making because of their constituting the first venture in diesel engine propelled passenger vessels of such high speed,—16½ knots—by any American steamship corporation. Both went into service about midyear. The *Dixie* went into service in January, 1928. Toward the year's end, the Atlantic, Gulf & West Indies Lines sought bids on the construction of two fast ships for its New York-Havana service, and the Berwind-White Coal Mining Company placed orders with the Bethlehem Shpibuilding Corporation for the construction of two colliers specially designed to meet definite operating conditions. The latter were distinguished by being the first vessels built in this country to burn pulverized coal as fuel. These colliers are to be 366½ feet long over all, 350 feet between perpendiculars, 50 feet beam and 25¼ feet draft on a deadweight carrying capacity of 7,240 tons. They will cost about $750,000 each.

U. S. SHIPPING BOARD ACTIVITIES

Ship Sales.—The United States Government through its Shipping Board and Merchant Fleet Corporation is still the dominant factor in our merchant marine affairs. It is, therefore, of more than passing interest to note a few of the more important features of its activities during the period under review and particularly, that for the fiscal year ended June 30, 1928. Four complete lines of 45 vessels of 401,802 d.w.t. total, and two other vessels of 18,260 d.w.t. total,

were sold for guaranteed operation. In addition to these, twenty ships with a total d.w.t. of 133,942 were sold to private American owners. This record brought the total sales to June 30 up to 1,557, with an aggregate d.w.t. of 7,587,238. Fifteen established lines are included in this total. With these sales, only 758 vessels remain in Government ownership. The twenty-one established lines which were still being operated by the Shipping Board on June 30 are offered for sale to American citizens "at low prices and on attractive terms." Bids were to be opened on December 11, 1928, for the purchase of 45 vessels of the laid-up Government Fleet, either for scrapping, conversion to diesel propulsion, conversion to barges or operation as steamships. If the Shipping Board is able to sell these ships, the total remaining of the laid-up fleet will be less than 450 vessels.

Losses in Operation.—Total loss on operations and vessels laid up during the fiscal year ended June 30 amounted to $17,391,000, including the loss to the United States Lines of $465,000 compared with the net profit of $371,000 during 1927. Exclusive of the loss to the United States Lines, the net loss for cargo and combined passenger and cargo services for voyages and inactive vessels amounted to $16,926,000 which is a reduction of $1,364,000 from the 1927 figure. Profits from tanker operations decreased from $782,000 in the fiscal year 1927 to $165,000 in 1928. This large decrease was caused by the very much depressed condition of the tanker market, which led to the withdrawal of tankers from activities in the commercial field and the limiting of their services practically to the handling of fuel oil on account of the Merchant Fleet Corporation. Miscellaneous income, which heretofore has been derived principally from the operation of army bases, interest and fuel sales, decreased from $1,286,000 in 1927 to $894,000 in 1928, due largely to the fact that in 1928, by a ruling of the Comptroller General of the United States, the Merchant Fleet Corporation was not permited to use the interest earned on bank balances.

Fuel and Drive Improvements.—The experiment of burning powdered coal as fuel on the Shipping Board freighter *Mercer* having proved a signal success in actual ocean service, development possibilities have concentrated attention on its more general adoption and on ways and means for simplified application and increased efficiency; the *Mercer* being the first ocean-going steamship ever so equipped. Another notable development of the past year was the rereplacement by diesel-electric drive of the geared steam turbine drive originally installed in the Shipping Board freighters *Courageous, Triumph* and *Defiance.* Diesel-electric drive installations, while not a distinctive achievement of 1928, nevertheless indicate the desire and disposition of those who have the well-being of an American Merchant Marine at heart to take full advantage of every engineering advance offering increased economy and efficiency. The *Courageous,* the first of the three to have the installation completed, has already gone through a searching series of trials, the results of which exceeded the highest expectations of those responsible for the conversion.

Trade Rivalry and Adjustments.—Rivalry in marine transportation today is keener than ever before and is as evident in national as in international merchant marine activities. Overseas trade has been expanding and continues to do so, yet freight rates have had a downward trend for the most part; a circumstance due to a generally overbuilt position, primarily as a result of new construction abroad, and secondarily, because of the availability of much of the war-built tonnage, obsolete and near-obsolete, which ownership grimly keeps intact against a future opportunity to earn. Passenger rates, on the other hand, have been well maintained; therefore, where vessels have been employed in the combination capacity, losses have been minimized and in not a few cases reasonably substantial profits have been earned. Such conference troubles as arose

were confined to the intercoastal trade via Panama Canal, and to the jute trade from the Far East to American ports. Adjustments more or less satisfactory were the outcome.

Trans-Atlantic Service Project.—Proposal to establish a new American ocean service, otherwise the project of the Transoceanic Corporation of the United States to build six ships in American shipyards capable of crossing the ocean in four days from dock to dock on a sailing schedule of three times a week from each side of the Atlantic, was presented to the United States Shipping Board for consideration by that body on January 24. Aid from the construction loan fund was sought. Expectations are that 1929 will see some definite action taken to put the project into effect.

ACCIDENTS AND LOSSES

Lives Lost.—The American Merchant Marine and its personnel in common with those of other nationalities experienced tragedy and disaster yet, comparatively, our 1928 portion might be called normal in the light of the toll annually demanded of seafarers and seacraft. The total number of lives lost from all causes, passengers and crew, was 275, an increase of 13 over the previous fiscal year. Of the lives lost, 142 were from suicide, accidental drowning, and other causes beyond the power of the Steamboat Inspection Service to prevent, leaving a loss of 133 fairly chargeable to accidents, collisions, founderings, etc. During the fiscal year, 230,874,917 passengers were carried on steam vessels that are required by law to report the number of passengers transported. Dividing this number by 81, the total passengers lost, shows that 2,850,307 were carried for each passenger lost. In connection with the prevention of overloading of vessels, 2,709,235 passengers were counted during the year by representatives of the Steamboat Inspection Service.

Rescue Work.—Heroic rescue work by American ships and American seamen again has been added to our record on the high seas and, what is true with regard to them, is at least equally true of the United States Coast Guard Service and its far-flung activities in protecting the coasts of the nation from smugglers, in aiding ships and persons in distress, and in patrolling more or less ice-bound and ice-infested waters on the lookout for the iceberg menace in ship lanes. During the fiscal year 1928, the Coast Guard rescued 3,983 persons from peril, aided ships valued at $39,479,720 on which there were 17,383 persons and seized or reported for law violations 1,554 vessels. Derelicts valued at $103,520 were recovered and restored to their owners, while 167 derelicts and obstructions to navigation were destroyed.

THE AIRSHIP AND AIRPLANE TECHNIQUE

By Ernest Jones

Director of Aeronautics, Department of Commerce

GENERAL PROGRESS

As the first quarter-century of mechanical flight closed Dec. 17, 1928, the twenty-fifth anniversary of the flights of the Wrights, we note a progress in the air greater than that made by the steam railroad in its first similar period. The past has seen a tremendous activity and growth in every phase of civil aviation. In civil aerostation there is still no activity though transcontinental airship routes have been promised for several years.

The public, now fully alive to the possibilities of air transportation and its needs, is readily investing in air transportation, manufacturing and allied enterprises. The Department of Commerce has made rapid progress in a tremendous program of lighted airways. Contract air mail, passenger and express lines are regularly operating in an ever-increasing number of sections; airplanes are being

largely purchased by private persons and business firms for the purpose of conducting their own affairs, in addition to purchases for air taxi, touring, photography and other air services.

Government and civil agencies are cooperating in an extensive program of technical development of air craft, accessories, and aids to air navigation, and rapid progress is being made in the reduction of risk and cost.

PILOT AND AIRCRAFT REGISTRATION

Licenses.—At the end of the year 5,605 pilots of one grade or another were Federally licensed or with cases pending, in addition to which 10,262 student permits had been issued. Aircraft to the number of 4,156 were licensed or in the pending class while 2,164 others were similarly situated in the matter of identification only for purely intrastate operations. Various models of modern airplanes to the number of 97 were approved by the government, while 15 engines were given similar certificates.

In flying sport Germany and the United States had equally between them 64 of the 106 established world records for balloons, airships, airplanes, light planes, and seaplanes. The remaining records are divided among seven other countries. Eighteen of America's list are in the seaplane classification and eleven are for balloons, two for airplanes, and one for light planes. The only standard land airplane records held by this country are for altitude and speed. One was made in 1927 and one in 1925. The light plane cross-country distance record was made by the late Harry J. Brooks from Detroit to Titusville, Florida,—1,564 kilometers,—Feb. 21, 1928.

AIRPLANE TYPES

Airplane types trend toward standardization for particular services. The biplane continues the favored for military purposes and in the smaller commercial models. For passenger transport and touring, monoplanes are preferred whether single or multi-engined. Enclosed bodies are being produced in increasing numbers. The re-discovery of our waterways has caused the return of the seaplane and encouraged the amphibian. Metal floats or hulls have eliminated water absorption.

The Biplane.—The great bulk of civil production is in the light three-seater 90/100 h.p. biplane, sold to private persons, flight students, and air taxi, sight-seeing, photography, and general air service operators as apart from air transport.

The Monoplane.—For transport and more extensive sight-seeing or touring, the multi-engined monoplane is generally preferred. For use of industrial executives, private persons and miscellaneous flying, the standard is a cabin monoplane of 200 or more horsepower, considerable attention being given to interior finish, comfort and elimination of noise. Muffled exhaust is having a belated introduction. In the multi-engine class the cabin has practically all the personal conveniences of rail or water transport, and attention is being given to sleeping accommodations for long-distance night service.

Speed.—Airplane speed has not yet reached its limit apparently, as the winner of the 1928 international seaplane race made 318.6 miles an hour. The average commercial speed, however, has settled between 90 and 120 miles, and the immediate commercial demands will probably not warrant sacrifices in other directions for the sake of additional time saving.

Carrying Capacity.—Constant improvement is being made in performance. From approximately 2.02 pounds per square foot of wing-loading on the early Wright, we have trans-oceanic planes carrying 20 pounds to the square foot. The useful load has advanced from 17.6 to 40-45 per cent, and the speed from 40 to 120 miles per hour.

AERODYNAMICS

Improvements.—Research has continued in fundamental problems. Various devices have been successfully demonstrated or are in course of development to give controllability to a plane which has, for any reason, assumed an attitude of instability.

Other investigations of aerodynamic safety, differential aileron control, balanced ailerons, ice formation, take-off and landing runs, engine cooling, landing gears, air screws, fog flying, instruments, adjustable stabilizers and the like are noted.

MACHINE PROGRESS

Materials.—Practically all American planes are now built with metal bodies and at least six all-metal (duralumin) planes are on the market and in operation in the hands of owners.

Accessories.—Hydraulic and mechanical brakes are generally being applied on both military and civil planes of all types save light planes, in combination with shock absorbers. Commercial radio telephone sets, for both transmission and reception, are on the market for use with the government's radio beacons and radio telephone transmitting stations and otherwise.

Instrumental Research.—Research work continues on the further development of present and new airplane instruments. The earth inductor compass has proved its capabilities. Among other instruments are greatly improved types of inclinometers, air speed indicators, bank and turn indicators, drift indicators, flight indicators, etc. The arrangement on instrument boards has been condensed, and new systems combine the readings of several instruments in a single vertical panel comprising a number of scales on one vertical dial.

ENGINE DEVELOPMENTS

Air-Cooled Engines.—The air-cooled type of engine holds predominance though several new water-cooled engines are on the market. Two 525-horsepower air-cooled engines have been produced, primarily for military purposes but the development of passenger planes is providing a market for the higher powers. The 200-225-horsepower air-cooled engine, however, still remains the standard for general operations involving passengers, mail and goods. A number of both types of engines are used in a position inverted from normal. To replace the 90-100-horsepower war surplus engine which has made possible the low priced two- and three-place planes now in the majority, many new designs are on the market, at, of course, higher prices. In the main these engines are air-cooled. Low-powered air-cooled engines are also finding considerable market.

Oil Engines.—Progress is being made with oil fuel injection engines. This type has reached a weight ratio which will permit its use in airplanes, and before another year is over may be in commercial production.

Supercharger development continues and it is now ready for practical use. The increase in ceiling climb and speed made possible thereby is expected to encourage the use of this device in commercial as well as military flying.

Radiators and Propellers.—The proper placing of radiators for minimum head resistance and efficient cooling in the various types of planes continues to receive attention, but the cartridge type of radiator has become standard. The expense of the wing radiator does not permit its use in commercial craft. There is continual development of manufacturing technique in propellers and a strong trend towards adjustable blades.

FLIGHT FACILITIES

Lighting.—Over 9,000 miles of mail airways were lighted at the close of 1928, with 259 lighted intermediate fields along the routes, out of a total airway mileage of 16,667.

Weather Service.—A concentrated radio telegraph weather reporting service is in operation on the following mail airways: San Francisco-Chicago, Chicago-New York, Dallas-Chicago, Atlanta-New York, Salt Lake City-Burley, Ida. On other mail airways telephone service is in use, pending extension of the radio-telegraph. The Weather Bureau has 46 upper air meteorological stations scattered about the country on mail and other airways, cooperating with all users of the airways. A beginning was made during the year in the use of radio telephony from the ground

to the pilot in flight. Three radio telephone broadcasting stations are operating between Cleveland and New York and in this area the pilots receive information concerning their safety while *en route.*

Radio Beacons.—Three radio beacons of the aural type were put into service between Chicago and New York, enabling pilots equipped with receiving sets to be certain at all times of their exact course regardless of visibility.

Air Routes.—At the end of the year 62 separate airways were being flown in the United States by 38 different operators; of these, 23 operators were contractors carrying mails over 14,155 miles of routes.

Airports.—Over 840 municipalities or commercial concerns have established airports. In addition the army and navy have 80 and there were 960 more proposed or under inauguration at the close of the year.

Hazards.—The hazard of fire has been largely reduced in both military and civil flying through the use of gravity feed, improved exhaust manifolds, fire walls and improved fitting construction. In all flying the crash percentage grows smaller, and safety in routes is recognized by the life insurance companies which have eliminated exception clauses in policies. All phases of insurance are now written to cover air risks. In military flying and in certain mail services in mountainous areas parachutes are still standard equipment. The pilot or passenger wearing this device jumps clear of the plane and after a few seconds pulls a ring in the harness which releases the parachute itself.

Air Marking.—It is estimated that some 5000 air markers have been erected in cities and towns throughout the United States. Several nationally known corporations have marked their holdings scattered in all parts of the country. In addition municipal governments, chambers of commerce, and other civic organizations, clubs, individuals, local concerns and others have sponsored the air marking of one or more buildings in their respective communities.

GOVERNMENTAL AIR AGENCIES

The United States Government air activities are mainly divided among five separate agencies carrying on important aeronautical work as follows: United States Army Air Corps, the Navy Bureau of Aeronautics (in which is incorporated the Marine Corps), the Air Mail Service of the Post Office Department, the National Advisory Committee for Aeronautics and the Department of Commerce.

U. S. Army Air Corps.—The Army Air Corps is a separate combatant branch of the army. The five-year program passed by the Sixty-ninth Congress authorized an Assistant Secretary of War for Aeronautics and a strength of 1518 officers and 16,000 enlisted men including 2,500 flying cadets. The program anticipates a permanent material strength of 1,800 useful airplanes and such airships and balloons as the Secretary of War may deem necessary, with an annual replacement not exceeding 400. The total increase in personnel and equipment is to be distributed over the period. The same bill authorized an Air Section in the General Staff.

For the instruction of its personnel the Air Corps maintains a technical school, two primary schools and an advanced flying school, a tactical school, a school of air medicine, a balloon and airship school, and an engineering school under the direct supervision of the Chief of Air Corps, while a number of fields located at other places throughout the United States occupied by tactical units are under the immediate command of Corps Area or Department Commanders of the Army.

The engineering division, which operates an elaborate plant at Dayton, Ohio, has continued its development work. While other types of military planes have become standardized, new designs of attack and bombing planes are being built. Other experimental work includes aircraft armament, radio beacon and other radio, skiis, brakes and disc wheels, shock absorbers and cameras.

Mapping.—Forty-one of its program of fifty-two airway maps have been completed and the balance is in

progress. Future work of this character is being done by the Department of Commerce. During the year both the army and the navy photographed thousands of square miles for mapping purposes.

Contests and Exhibitions.—The Air Corps participated in contests and exhibitions, and aided in flood relief. The annual cooperation was given the Forest Service in fire patrol.

U. S. Navy Aeronautics.—Naval aeronautics with another new Assistant Secretary of Navy for Aeronautics has passed its second year under the five-year program which authorized 1,614 airplanes to be purchased during the five years; a useful strength of 1,000 to be maintained after 1932. Contracts have been let for two rigid airships of 6,500,000 cubic feet and one all-metal airship of about 200,000 cubic feet, all now in process of construction. In the meantime the *Los Angeles* is in operation. A new helium gas field has been opened and one private plant is in operation. (See Naval Aeronautics.)

The National Advisory Committee for Aeronautics, composed of twelve members, appointed by the President from governmental departments and civil life, is charged with the duty of the supervision and direction of the scientific study of the problems of flight, with a view to their practical solution and the determination of problems worthy of experimental attention, and the presentation of the results of their experimental and scientific work for the advancement of and practical application to the development of aeronautics. For the accomplishment of these ends, the N. A. C. A. has a well-equipped research laboratory located at Langley Field, Hampton, Va. The N. A. C. A. functions through an executive committee and standing technical committees, which assure coordination with other government air agencies and the public.

While accomplishing work in its own laboratory on the more fundamental principles of aeronautics, the Committee also functions in the direction and allocation of work on particular problems by various other governmental and private institutions. It not only makes available the results of its own experimental and research work but collects and makes available aeronautical data and information secured from existing agencies throughout the world.

The Post Office Department inaugurated the first air mail service in the United States and, until September 1, 1927, operated the transcontinental air mail. Both sections of this route were turned over to private enterprise at the latter date and all air mail routes now in operation are conducted by private enterprise under contract with the Post Office Department.

Department of Commerce.—Under the Air Commerce Act of May 20, 1926, the Department of Commerce is charged generally with the encouragement and regulation of aircraft in commerce under an Assistant Secretary of Commerce for Aeronautics. Briefly, the Secretary will generally foster air commerce through encouragement of airports, airways and other air navigation facilities; rate and register civil and public U. S. aircraft; examine and rate airmen and facilities; establish air traffic rules, establish and operate civil airways and navigation facilities except airports; chart and publish maps thereof; and recommend meteorological service to the Secretary of Agriculture; study possibilities of development of air commerce, industry and trade; collect and disseminate information; investigate, record and publish causes of accidents; issue, suspend or revoke registration, aircraft or airman certificates.

On July 1, 1927, the Department took over, on agreement with the Postmaster General, the airways, emergency fields and other air navigation facilities then under jurisdiction of the Post Office (except airports and terminals which were transferred to the municipalities concerned). The Act also provides that air navigation facilities owned or operated by the United States may be made available for public use. Government establishments owning or op-

erating air navigation facilities may provide fuel, oil, equipment, supplies, service, shelter and other assistance in emergency at fair market value under rules of such establishment. The Agriculture, Treasury and Labor Departments were also charged with certain duties under the Act.

OTHER GOVERNMENT AERONAUTICS

The President.—From the inception of flight the Presidents have lent encouragement. President Lincoln, it will be remembered, established America's first air service (balloons). Under the Air Commerce Act of 1926 the President is empowered to "set apart and protect air space reservations for defense, public safety, or other governmental purposes."

Department of State.—Aeronautic reports of the Diplomatic and Consular Services are made available to the industry.

Department of Commerce.—Aeronautics Branch was organized in the office of the Secretary under the Air Commerce Act of 1926, specifically charged with the "encouragement and regulation of the use of aircraft in commerce."

The Bureau of Foreign and Domestic Commerce maintains commercial attachés and trade commissioners in all important countries. Their reports are made available to the public; opportunities for the sale of American aeronautical equipment abroad are brought to the attention of American firms.

The Bureau of Standards has, from the beginning of flying, been actively engaged in the development of the technical side of aeronautics from almost every angle and is in contact with flight through the verification of instruments used in nearly every new record established by aircraft in this country and in the researches conducted for the various Departments. It has been given added duties in the development of the radiobeacon and other radio, lighting and other aids to air navigation for the Department of Commerce.

The Patent Office obviously has to do with aeronautic patents and their number runs into the thousands.

The Bureau of Mines uses the airplane frequently to carry rescuers and machinery to the scene of mine disasters and for surveys and maps. To the aeronautical world it is best known for its work in helium research. Its plant at Fort Worth produces the helium required by the military air services.

The Bureau of Fisheries, in its conservation work and in the development of agriculture, has studied the airplane in connection with the development and control of commercial fisheries and has actually demonstrated the use of the airplane in this work.

The Bureau of the Census is concerned with various statistics. In its biennial census of manufactures it includes aircraft, engines and accessories.

The Bureau of Lighthouses is now, under the Air Commerce Act, directly engaged in the installation and maintenance of light beacons and intermediate fields and other aids to air navigation such as the radiobeacon, radiotelegraph and radiotelephone along the airways.

The Coast and Geodetic Survey is now also charged with air mapping. The Survey has used aerial photographs in its normal work ever since 1920.

Department of Labor.—The Secretary of Labor, under the Air Commerce Act, designates ports of entry for air immigrant aliens, details men and applies the general immigration laws to air travelers.

Department of Agriculture.—The airplane and the airship have already been employed by this Department to a greater extent than in any other purely civil branch of the government, except the Post Office.

The Weather Bureau is now specifically charged with furnishing weather information to civil airways. New upper air stations have been established at airports or in their vicinities and a system of distribution was put into effect on the airways in the latter part of 1926.

The Forest Service has used airplanes for forest fire patrol annually since 1919.

The Forest Products Laboratory. —In the development of aircraft structures the laboratory has been of inestimable value to the airplane industry.

The Bureau of Entomology has conducted extensive war by air against wheat rust, the boll weevil, locusts and other pests.

The Bureau of Agricultural Economics has done crop reporting by airplane observation and aerial photography in experiments which successfully demonstrated the airplane's efficacy.

The Bureau of Public Roads uses the airplane in the making of mosaics of highways and this application of the airplane will increase in volume.

The Department of the Interior is charged with the supervision of the General Land Office, Bureau of Reclamation, Geological Survey, Office of Indian Affairs, Pensions, Bureau of Education, the National Park Service and the Government Railroad in Alaska.

The Geological Survey has extensively used airplanes, in the production of new maps and the correction of old.

The Treasury Department, under the Air Commerce Act, designates ports of entry for aircraft, details customs men, and applies the laws relating to customs and public health. The Internal Revenue uses airplanes in the attempt to enforce prohibition.

The Public Health Service has to do with quarantine regulations, the water supply on aircraft and other common carriers. Air immigrants must undergo medical examination by this service.

The Coast Guard, which renders assistance to vessels or aircraft in distress and gives medical aid to deep sea fisheries, also protects custom revenues, enforces laws and regulations governing anchorage of vessels in navigable waters, and quarantines, protects game and other fisheries, etc. A Coast Guard air service has been in existence for the past five years.

War Department. — The General Staff prepares war plans and considers how, when and where the Air Corps of the army will be employed with the other services. From the first use of balloons in American warfare in 1861, balloons and airplanes have been used with the artillery for fire control. Infantry has been familiar with aircraft for the same period, and aircraft are used in connection with their operations.

The Chemical Warfare Service, a comparatively new arm, is concerned with the development of toxic and other gases, smokes and incendiary material used by aircraft as well as otherwise.

Army Engineers have employed aircraft to a greater extent for their work on rivers and harbors, establishment of harbor lines, anchorage grounds, power projects, in surveying and mapping.

The Ordnance Bureau is concerned with the armament of aircraft but does not operate aircraft for its own purposes.

The Chief of the Signal Corps has charge of the development of all signal equipment, meteorological and other instruments used in connection with military aircraft in peace and war but this service no longer operates aircraft.

Navy Department. — (See NAVAL AERONAUTICS.)

Smithsonian Institution, among other things, has the custody of aeronautic material representing the progress of the art. For more than three-score years it has been active in aeronautics. It encouraged three early attempts to cross the Atlantic by air and its officers were largely responsible for the use of the balloons in the Civil War and for the experiments of Langley.

The Board of Surveys and Maps correlates and coordinates the map and chart making and using agencies of the government and provides contact with states, counties, cities and the public. The Board is composed of representatives from all governmental agencies interested in maps.

The Federal Power Commission is interested in all matters pertaining to the utilization of natural resources

for the making and transmitting of power. The airplane is used in many of its surveys.

The Aeronautical Board appointed by the Secretary of War and the Secretary of the Navy, is concerned solely with aeronautics and is designed to prevent duplication and to secure coordination between the army and navy air services.

Advisory Air Coordination Committee, comprising the three Assistant Secretaries for Air of Commerce, Navy and War, recommends to the Secretaries of War, Navy, and Commerce general policies relating to the coordination of the air activities of the government.

Patents and Design Board.—The Army Air Corps Bill of 1926 created this Board consisting of the three Assistant Secretaries for Air. Any individual, firm or corporation may submit a design for aircraft, aircraft parts or aeronautical accessories, whether patented or unpatentable, to the Board. After recommendation from the National Advisory Committee for Aeronautics, it can determine whether the use of such designs by the government is desirable or necessary, and fix worth to be offered the owner for rights.

Committee on Aircraft and Fog Flying Research.—To further research, particularly in fog flying, an unofficial committee was organized by the Daniel Guggenheim Fund for the Promotion of Aeronautics, comprising also representatives of the Department of Commerce, Bureau of Standards, Bureau of Aeronautics of the Navy, the Post Office and the Army Air Corps. Other subjects are also considered, such as the radiobeacon, capacity altimeter, field localizer, acoustic altimeter, lighting and others.

RADIO

By J. H. Dellinger

Chief Engineer, Federal Radio Commission

GENERAL PROGRESS

The year 1928 was marked by advances in technique, stabilization and applications throughout the whole field of radio. Steady progress, rather than revolutionary change, was the order of the day. Broadcasting improved, both in the areas served by the transmitters, and in the convenience and quality of reproduction and selectivity of receiving sets. An outstanding event was the new allocation of broadcasting stations by the Federal Radio Commission. This reduced interference, and particularly improved reception for the farmers and others remote from the stations.

Outside of broadcasting, the year was marked by extensive exploitation of the high frequencies, above 1500 kilocycles. Commercial applications of numerous kinds have been projected and some of them placed in operation, utilizing the high frequencies. This development was made possible by increased knowledge of distance ranges and other characteristics of the various ranges of high frequencies and consequent improved technique in their use.

The advances in radio application were not only by technical discoveries and development but also by improved national and international regulation. An example is the abolition of damped-waves. The perfection of tube apparatus made possible the abandonment of spark apparatus and this technical possibility was fulfilled through governmental and international orders requiring the replacement of damped-wave apparatus. Frequencies and other conditions of operation of stations were adjusted, in this and other countries, to conform to the requirements of the International Radio Convention, adopted at Washington, 1927, effective January 1, 1929.

The radio industry prospered. Sales were the best in history. Business showed every evidence of recovering from the slowing down in 1927

caused by uncertainty over Federal regulating authority. The industry was stabilized by a number of mergers of large manufacturing and communication interests.

RADIO MANUFACTURE AND SALES

Radio manufacture and sales increased greatly in volume in 1928. The receiving sets sold were predominantly (probably four-fifths) those supplied from the alternating-current socket rather than batteries. The greatest increase was in furniture models (sets in consoles, etc.). Fine appearance characterized all sets of the year. Loud-speakers of the electrodynamic type (in which the moving element is a coil in the field of an electromagnet) were sold in increasing numbers; these permit very great volume of reproduced sound without distortion. Their use brought out highly powerful amplifier tubes, as they function best on a power amplifier. Radio tubes were marketed in greater variety of types than ever before, and were much more freely available. Many companies started manufacturing tubes, as a result of an injunction against the Radio Corporation of America in respect to the provision of its license contract limiting receiving set manufacturers to R.C.A. tubes in initially equipping their sets.

The U. S. Department of Commerce issued the biennial census of manufacturers, from which are taken the data on radio sales for three past years given in the table below. This shows that 1925 was a peak year in most respects. While the total of sales was greater in 1927 than in 1925, a number of the items show a decrease in 1927. The sale of parts (for home construction of sets) has diminished steadily since 1923. Headphones have become negligible in importance, being replaced almost entirely by loud-speakers. Receiving sets are almost all of 5 tubes or more. Note that the retail values are about twice the figures given.

RADIO EQUIPMENT MANUFACTURED

(Wholesale values.—Retail sale prices may be taken about twice these values.)

	1923	*1925*	*1927*
Receiving Sets—			
4 tube and smaller—			
Number	413,677	2,395,790	30,962
Value	$13,996,022	$93,356,546	$613,715
5 tube and larger—			
Number			1,907,230
Value			$93,436,316
Transmitting Sets—			
Value	$919,930	$1,355,768	$2,233,483
Transformers—			
Number	1,571,817	5,295,507	4,093,160
Value	$3,929,581	$7,614,774	$5,446,550
Rheostats—			
Number	1,085,171	3,562,543	2,327,275
Value	$955,396	$2,018,592	$1,420,780
Socket-power Devices—			
Number			1,405,191
Value			$23,357,814
Miscellaneous Parts—			
Value	$13,421,659	$30,353,599	$29,107,818
Radio Tubes—			
Value	$9,824,172	$21,170,610	$17,046,614
Loud-Speakers—			
Number	623,146	2,844,652	2,446,264
Value	$5,608,330	$18,955,916	$18,868,849
Head Sets—			
Number	1,781,793	1,352,442	267,349
Value	$5,345,380	$2,164,529	$316,726
Total value	*$54,000,470*	*$176,990,334*	*$191,848,665*

TOTAL RADIO SALES, 1928

(From survey of *Radio Retailing*)

	Number	*List price value*
Receiving sets	2,550,000	$306,000,000
Radio-phonograph combinations	81,300	38,000,000
Cabinets (for set construction)	800,000	42,000,000
Batteries (A, B, & C)	.....	50,400,000
A & B power units, storage batteries, chargers	.....	17,500,000
Other accessories	.....	8,000,000
Parts	.....	12,000,000
Radio tubes	50,200,000	110,250,000
Loud-speakers	2,460,000	66,400,000
Total		$650,550,000

Receiving Sets.—The total number of receiving sets in the U. S. was estimated by *Radio Retailing* in May to be 12,000,000. This estimate may have been a little high, and it is believed that at the end of the year there are about 8,000,000 sets with loud-speakers and 4,500,000 with head-phones.

GOVERNMENT REGULATION

Limiting Stations. — This year marked the beginning of firm control of radio by the Federal Government. The Federal Radio Commission was created by the Radio Act of 1927, and was armed by Congress with complete authority to regulate radio. An unfortunate situation had been increasing for several years, *viz.*, the number of radio transmitting stations was excessive, the communication channels were overcrowded, and interference was serious. To correct this, Congress gave the Commission power to keep the number of stations in accordance with the actual number of channels available. The law not only gave the Commission the authority to choose among applicants for the radio channels, but also provided a judicial principle to be the basis of choice, *viz.*, the principle of public convenience, interest, or necessity.

Service Basis for Station Applicants.—Prior to 1928 the Commission confined its work essentially to piecemeal elimination of the worst phases of the broadcasting chaos that had developed before the passage of the 1927 Act. In 1928 comprehensive regulation was undertaken, not only of broadcasting but of all radio. The provisions of the law for choice among station applicants on the basis of public service were put into effect, and it became the standard procedure for the award of a communication channel to be based on a hearing before the Commission.

New Broadcasting Allocation.—The outstanding event of the year's work in governmental regulation was the new allocation of broadcasting stations, which was put into effect Nov. 11. In the broadcasting band of frequencies, from 550 to 1500 kilocycles, there are 96 channels, of which 6 are used exclusively by Canada, leaving 90 on which the U. S. can have stations. With some 630 stations on 90 channels there had been very great interference which could not be remedied except by a scientific reallocation of all stations. The new allocation of stations was made in conformity with the following principles: (a) limited the simultaneous operation of an excessive number of stations by making many of them divide time; (b) assigned frequencies carefully selected with regard to geographical separations of stations, to reduce inter-channel interference (*i.e.*, disturbance of reception of a station on one frequency by other stations on adjacent frequencies); (c) limited the power of stations so they would not cause interference to other stations on the same frequency; (d) provided for 40 stations of high power, each the exclusive occupant of its channel.

Allocation Results.—The new allocation of broadcasting stations provided listeners with a much improved service, stations being audible

throughout the receiver dial. There were a few localities where the improvement was not in evidence at first, and correction of the condition was undertaken in these cases by the Commission. The greatest advance was made in the rural areas, remote from stations. Interference had largely destroyed radio service in these areas previously, but under the new allocation farmers in most localities were able to hear a variety of programs, mostly from the high-power stations on exclusive channels.

High frequencies, or short waves, likewise received considerable attention from the Federal Radio Commission. They have come into use very rapidly in the past two years.

BROADCASTING

Presidential Campaign.—The use of radio in the presidential campaign was an outstanding development. Party leaders recognized the strategy of a campaign waged by the aid of the microphone. All the major speeches of the principal candidates were broadcast to extensive networks of radio stations, sometimes as many as 100 being in the chain. About $2,000,000 was expended by the two leading political parties for time on the air. These expenditures were found to be more productive than other forms of advertising.

Daytime Stations.—A development based on improved knowledge of engineering facts was the advent of daytime broadcasting stations. The new allocation, already described, was so devised as to be applicable primarily to nighttime. Since the transmission distances are much less in the daytime. some additional stations can operate in the day. About 50 such stations were accordingly licensed, and found to render valuable service without adding to interference. These stations cease operation at sunset.

Station Chains.—The extent of the station networks, or chains, was greatly increased during the year. The National Broadcasting Company made regular connections with the West Coast, so New York programs became part of the entertainment of many listeners along the Pacific.

Improvements in receiving sets included the furnishing of complete socket power supply by practically all manufacturers, dispensing with batteries. Alternating-current supply is an accepted success, but direct-current socket supply is not yet on a commercial basis. A few sets appeared having automatic volume control to compensate for fluctuations of wave intensity. This is a hopeful start upon the very difficult battle with that serious enemy of reception known as "fading."

Transmitting Improvements.—There were improvements also at the transmitting end of broadcasting. The American Telephone and Telegraph Company demonstrated that 100% modulation could be provided without loss of quality, even in transmitters of very high power. This increases the effective distance of transmission. There was a trend to the uso of transmitters with automatic piezo control. When these are fully worked out and extensively used, synchronization of stations will be in sight, heterodyne interference will disappear, and more broadcasting stations can operate.

Stabilization of Broadcasting.—There were a number of mergers or alliances of large companies, indicating the stabilization of broadcasting. One of these was the arrangement linking up DeForest Radio Company, Kolster Radio, Brandes Inc., and Wired Radio Inc. The last-mentioned is a company formed to broadcast programs over the electric power wires. The branching out of radio technique into allied fields has its reflection in the business world also in the affiliation between the Radio Corporation of America and the Victor Phonograph Co., and the formation of the Radio Corporation subsidiary, R. C. A. Photophone Inc., to exploit talking motion pictures. A similar combination was that of the Columbia Phonograph Co. (which conducts a network broadcasting service), Western Electric Co., and Electrical Research Products Corporation. The latter is an A. T. and T. subsidiary exploiting talking motion pictures.

VISUAL BROADCASTING

Procedure.—The broadcasting of pictures and of moving pictures and television was inaugurated. These services are grouped together under the term "visual broadcasting." It was carried on by about a dozen broadcasting and high-frequency stations. The stations doing this on broadcast frequencies were allowed to do so only a few hours per day, because of the disturbing sounds such transmission causes in the loud-speakers of the listening audience. Visual broadcasting is unsuited to the regular broadcast frequencies because of this, and also because the broadcasting channels are not wide enough for satisfactory television quality.

Television appealed to the imagination of many people and thousands of television reception outfits were sold. The received moving images were crude silhouettes or barely recognizable faces. The usual reception outfit consisted principally of a rotating disc with rows of holes together with a neon glow lamp. This had to be used with a receiving set and amplifier.

The television transmitting apparatus typically consisted of a rotating disc with rows of holes, a powerful light source, and photoelectric cells to convert the varying light into varying electric current. The General Electric Company gave some demonstrations and announced that a home television set was being prepared for the market. The Bell Telephone Laboratories gave a demonstration in which sunlight replaced the artificial illumination previously used. While the beginning was naturally rather crude and partial, it appears that the foundation of home television service was laid in 1928.

TRANSOCEANIC TELEGRAPHY

Extension of Service.—The Radio Corporation of America and the Mackay Radio and Telegraph Company extended their services, so that America is now the center of a world-wide net of radio circuits. The low-frequency transmitters were supplemented at all major stations by high-frequency stations, which were found economical in carrying the traffic. The high-frequency stations generally used beam antennæ.

Congestion Problems.—The extending uses of the high frequencies led to a veritable flood of applications for them to the Federal Radio Commission. This continued throughout the year, and introduced a congestion problem similar to that in broadcasting. In the whole band of high frequencies, from 1500 to 23,000 kilocycles, there are available about 1900 communication channels. This number may be increased in the future, as engineering progress permits simultaneous signals to be more and more closely crowded together in frequency. Of these 1900 channels at present available, approximately 1300 are in the band 6000 to 23,000 kilocycles, in which any signal may be heard all over the world. There are already some 2400 stations in the world operating on these frequencies, an average of about 2 per channel. This frequency band is therefore already fully occupied. Whenever more than one station is operated on a channel there is a potential source of interference. Additions can be made only in special cases, by consideration of the areas affected, times of operation, differing capacities of the various frequencies at different parts of the diurnal period, and engineering expedients like directional reception or transmission. The real nature of the congestion is apparent from the fact that the Commission was forced to deny hundreds of applications for licenses in this frequency band.

British Merger.—A development of international interest was the decision of Great Britain's Imperial Wireless and Cable Conference to merge all British cables and transoceanic radio telegraphic service under a government-controlled company. This will not include transoceanic radio telephony, which will continue under the British Post Office Department. The British radio-cable merger is expected to give them a considerable business advantage over American and other communication groups,

which do not have the advantage of combined service.

American Merger.—In the United States, there was some indication of the trend toward mergers, in the combination of Mackay Radio and Telegraph Company with International Telephone & Telegraph Company.

TRANSOCEANIC TELEPHONY

This service (originally opened January 7, 1927) prospered in 1928. The rates were reduced and business increased greatly. The areas served were extended so that now practically the whole of North America is in telephonic touch with all of Europe. The original low-frequency (60-kilocycle) circuit was supplemented by a high-frequency beam circuit. The construction of stations for radio telephone service with South America was begun.

MARINE RADIO

Coastal Service.—At the beginning of the year, the coastal service (communication with ships) was consolidated under the Radiomarine Corporation of America, which acquired the stations and assets formerly held by the two competing companies, Radio Corporation of America and Independent Wireless Telegraph Company.

Radio beacon stations operated by the Lighthouse Service to give signals for ships equipped with direction finders increased to 56, as follows: Atlantic coast, 20; Gulf coast, 3; Pacific coast, 10; Great Lakes, 20; Alaska, 2; Hawaii, 1. There are about an equal number, 57, in use in all foreign countries.

Automatic Alarm Apparatus.—In Great Britain, great weight was given to the newly developed automatic alarm apparatus for ships. About 800 British ships were equipped with automatic apparatus for receiving an alarm signal consisting of 12 dashes, each 4 seconds long, with 1 second spaces between. This signal is used to announce that the distress signal is to follow, and automatically rings a bell. The system thus dispenses with the operator on continuous watch for distress signals, and permits a reduction in the expense of operating staff. Investigations of the system made in the U. S. have not as yet convinced American authorities of the practicability of the system, despite the extent of its use on British ships.

AERONAUTIC RADIO

Beacon Stations.—The Department of Commerce installed directive radio beacon stations, for guiding aircraft, at five airports, and erected a number of radio telephone stations to communicate with aircraft in flight. These are the beginning of a network of such stations over the U. S. airways. Research work by the Bureau of Standards perfected a visual indicator for use on an airplane instrument board to guide the plane in fog. A radio-frequency altimeter was developed by the General Electric Company.

Value in Pioneering Flights.—Radio was used, and its value proved, on the long pioneering flights of the year. The Southern Cross, on its remarkable trip from California to Australia, was in touch with the world throughout the trip, by means of high-frequency radio. Radio was used by General Nobile in the navigation of the dirigible in his ill-fated arctic flight and played an important part in his rescue. Commander Byrd equipped his Antarctic expedition with very complete radio communication and direction-finding facilities.

RADIO AMATEURS

The amateurs concentrated their message relaying almost entirely on the high frequencies, above 3500 kilocycles, making very little use of their lowest-frequency band. They continued their record of service in times of emergency. After the tropical hurricane had swept away wire and radio facilities in Florida, Porto Rico, and the Virgin Islands, the amateurs immediately made an emergency communication system available. Amateurs have been graduating into the radio industry in the past few years. A large number of executive positions in the industry are held by former amateurs.

STATISTICS OF MANUFACTURES

By LeVerne Beales

Chief Statistician For Manufactures, U. S. Bureau of the Census

PRELIMINARY REPORTS

Content and Scope.—The Bureau of the Census has thus far (November 30, 1928) issued preliminary statistics covering 146 of 340 manufacturing industries in the census classification. The reports for these industries may be considered as statistical portrayals of conditions in selected portions of the entire manufactures field. They show the wage earners employed, amount paid in wages, cost of materials, value of products, and horsepower of prime movers. For many industries the quantities and values of the individual classes of products are shown in detail.

The census of manufactures is now taken biennially, but the vast amount of work involved in making the canvass and obtaining the additional data needed for the correction and completion of returns precludes the possibility of publication and of results within less than five or six months after the commencement of the canvass.

Industrial Values and Output.—Preliminary reports for these industries embrace some highly important activities, such as the manufacture of motor vehicles, tires and tubes, and aircraft. The total value of products for the 146 industries in 1927 amounted to $10,945,539,000 (these preliminary figures for 1927 are subject to correction, but it is not likely that any material changes will be made in them), as against $11,202,349,000 for 1925. The 1925 figure represents 17.9 per cent of the aggregate for all industries as reported for that year. These figures on their face indicate a decrease of 2.3 per cent, but this indicated decrease is due wholly to price reductions. When adjusted by means of wholesale price indexes prepared by the Bureau of Labor Statistics, they give approximately 5 per cent as the estimated rate of increase in the physical volume of production. The general tendency for the past two years is toward a moderate increase in quantity of output, accompanied by decreases in cost of materials, value of products, and number of wage earners, a slight increase in wage payments, and a marked increase in primary horsepower, as indicated by the following table:

	1927	1925	Per Cent of Increase or Decrease (—)
Number of establishments	19,456	18,975	2.5
Wage earners (average for the year)[1]	1,198,829	1,212,989	— 1.2
Wages	$1,627,663,198	$1,622,334,188	0.3
Cost of materials, supplies, containers for products, fuel, and purchased power	$6,329,591,889	$6,587,967,183	— 3.9
Value of products	$10,945,539,294	$11,202,348,642	— 2.3
Value added by manufacture[2]	$4,615,947,405	$4,614,381,459	[3]
Horsepower	5,517,631	4,772,247	15.6

[1] Not including salaried employees.
[2] Value f prducts less cost of materials, supplies, containers for products, fuel, and purchased power.
[3] Less than one-tenth of 1 per cent.

PRODUCTION AND WAGES

Output per wage earner, expressed in hypothetical quantity units, increased at the rate of approximately 6 per cent during the 2-year period, while the horsepower rating of prime movers in manufacturing establishments increased at the rate of 15.6 per cent,—from 4,772,247 in 1925 to 5,517,631 in 1927. The increase in out-

put per wage earner, which serves as a rough measure of the increase in the efficiency of industry as a whole, does not necessarily imply that the individual wage earner is more efficient than formerly, or would be more productive working with the same equipment, but that industry is making, through the introduction of new and improved machinery, more efficient use of his labor.

Wage Estimates.—While the number of wage earners employed decreased by 1.2 per cent, the total wages paid increased by three-tenths of 1 per cent, indicating a slight increase in average wages. No reliable data in regard to actual average wages can be deduced from the census statistics, for the reason that the figures for average numbers of wage earners are based on the monthly pay-roll averages which do not take account of such factors as temporary absence, part-time employment, etc. The actual average wage, therefore, for the group of industries in question was undoubtedly somewhat higher than the quotient obtained by dividing the total wages paid by the average number of wage earners employed during the year, calculated from the monthly pay-roll figures as reported by the manufacturers.

LEADING INDUSTRIES

Car Production and Value.—Of the industries for which statistics are available for 1927, the most important are motor vehicles, with products valued at $2,846,213,000; rubber tires and inner tubes, $869,688,000; cane-sugar refining, $597,446,000; leather, $494,781,000; coffee roasting and spice grinding, $380,157,000; cement, $293,565,000; and glass, $279,708,000.

Motor Vehicles.—The motor-vehicle industry led all others in respect to value of products in 1925, but it appears probable that in 1927 one or more of its close competitors for which statistics are not yet available outranked it. The total for 1927,—$2,846,213,000—represents a decrease of 11 per cent as compared with the corresponding figure for 1925. Of this total, $2,537,912,000 is the value of complete motor vehicles. As regards the several classes or types of motor vehicles, the decrease was far from uniform. Passenger vehicles (not including public conveyances) as a whole decreased 21.4 per cent in number and 13.8 per cent in value, but the decrease was entirely in open cars. Touring cars show a decrease of 80.7 per cent in number and 78.1 per cent in value, and roadsters, runabouts, etc., a decrease of 49.3 per cent in number and 35.8 per cent in value. On the other hand, closed cars increased 15.7 per cent in number and 7.3 per cent in value. The decrease in value of products was accompanied by a corresponding decrease of 10.5 per cent—$2,109,325,000 in 1925 to $1,888,039,000 in 1927—this included the total amount paid for materials, factory supplies, fuel, and power, and by less pronounced decreases in number of wage earners and wages,—5 and 5.7 per cent respectively.

Tires and Tubes.—Although the production of rubber tires and tubes is dependent in part on the output of new motor vehicles, it is determined in large measure also by the demand for replacement purposes; and, since many more motor vehicles were in use in 1927 than in 1925, it is natural that the production of tires should show some increase, despite the decrease in the production of motor vehicles. An increase of 8.1 per cent is shown in the number of pneumatic tires or casings for motor vehicles, although the number of inner tubes decreased by 8.4 per cent. The combined value of tires and tubes manufactured decreased by 5.5 per cent, from $824,549,000 in 1925 to $779,252,000 in 1927.

Rubber Consumption.—Manufacturers of tires and tubes consumed, in 1927, materials, supplies, fuel, and power costing $499,221,000, a decrease of 10.8 per cent as compared with the corersponding figure for 1925, and the number of establishments declined from 126 in 1925 to 109 in 1927. All manufacturers of rubber products (tires and tubes, rubber boots and shoes, and miscellaneous rubber goods), taken as a

group, reported the consumption of 364,017 long tons of crude rubber (exclusive of gums) in 1927, a decrease of 6.1 per cent as compared with 387,629 long tons consumed in 1925. These establishments also reported the consumption of 175,760 long tons of reclaimed rubber in 1927.

OTHER INDUSTRIAL STATISTICS

Cane Sugar.—A slight decrease in the activity of the cane-sugar refining industry is indicated by a decline of 6 per cent in the output of hard refined sugar, which fell from 5,243,548 tons, valued at $583,208,000, in 1925 to 4,927,991 tons, valued at $572,633,000, in 1927. The output of soft or brown refined sugar increased nearly 20 per cent in quantity and over 24 per cent in value, but the other products of the industry (sirup, molasses, etc.), show considerable reductions, the rates of decrease in quantity ranging from 17 to 35 per cent. The number of cane-sugar refineries reported for 1927 was unchanged, namely 21.

Leather.—The tanning, currying, and finishing of leather shows a rise in all items except the number of establishments, which fell from 532 in 1925 to 494 in 1927. The aggregate value of finished leather produced in 1927 was $438,873,000. The total value of products of the industry (including approximately $55,000,000 representing the value of products other than leather) increased from $462,014,000 in 1925 to $494,781,000 in 1927.

Coffee and Spices.—The roasting of coffee and the grinding of spices are carried on to a large extent by wholesale groceries and other establishments, in many of which they are secondary to the principal business. For this reason, and because a considerable amount of coffee is roasted by retailers, not covered by the census canvass, it was impossible to obtain complete statistics. According to the census figures, the output of roasted coffee in 1927 was 1,037,565,000 pounds, valued at $346,706,000, and that of ground spices, 49,328,000 pounds, valued at $17,435,000. The industry employed 8,168 wage earners in 1927.

Portland Cement.—As was to be expected from the increased use of concrete in construction work, the output of Portland cement in 1927, 173,207,000 barrels represents a substantial increase as compared with 161,659,000 barrels in 1925. The factory value of cement produced, however, declined from $293,965,000 in 1925 to $287,431,000 in 1927. The number of wage earners decreased from 38,437 in 1925 to 36,292 in 1927. The number of establishments engaged primarily in the manufacture of cement increased, however, from 145 to 161.

Glass.—The output of polished plate glass shows a slight decrease in quantity together with a marked decrease in value, from 117,369,000 square feet, valued at $57,207,000, in 1925 to 117,098,000 square feet, valued at $43,745,000, in 1927. The total output of the glass industry was valued at $295,959,000 in 1925 and at $279,708,000 in 1927. The most important item on the basis of value was the glass container which was valued at $100,301,000 in 1925 and of $114,381,000 in 1927. With the exception of pressed and blown glass, which increased in value of output 2.5 per cent, glass containers are the only products of the glass industry that show a material increase. The number of establishments engaged primarily in the manufacture of glass and glassware dropped from 310 to 269, and a somewhat smaller decrease was shown for the average number of wage earners.

Aircraft Products.—The total value of products of the aircraft industry increased from $12,525,000 in 1925 to $17,695,000 in 1926 and $20,784,000 in 1927. The number of airplanes, seaplanes, and amphibians manufactured increased from 711 in 1925 to 1,125 in 1926 and 1,857 in 1927, and the corresponding values increased from $5,908,000 in 1925 to $7,449,000 in 1926 and $12,024,000 in 1927. The number of establishments engaged primarily in the manufacture of aircraft increased from 44 in 1925 to 59 in 1926 and 61 in 1927.

Rayon.—The production of rayon in the form of yarn, sheets and waste increased from 51,902,000 pounds, valued at $88,008,000, in 1925 to 80,594,000 pounds, valued at $109,888,000, in 1927. The number of establishments engaged primarily in the manufacture of this commodity increased from 14 to 19 during the two-year period, and the number of wage earners increased 37.7 per cent, from 19,128 to 26,341.

COGNATE SOCIETIES

AMERICAN ASSOCIATION OF WOOLEN AND WORSTED MANUFACTURERS.—45 East 17th St., New York, N. Y.

AMERICAN AUTOMOBILE ASSOCIATION.—Penn. Ave. at 17th St., Washington, D. C.

AMERICAN PAPER AND PULP ASSOCIATION.—18 E. 41st St., New York, N. Y.

AMERICAN HARDWARE MANUFACTURERS' ASSOCIATION. 342 Madison Ave., New York, N. Y.

AMERICAN IRON, STEEL AND HEAVY HARDWARE ASSOCIATION.—47 W. 34th St., New York, N. Y.

ELECTRICAL MANUFACTURERS' COUNCIL.—30 E. 42nd St., New York, N. Y.

NATIONAL AMERICAN WHOLESALE LUMBER ASSOCIATION.—41 E. 42nd St., New York, N. Y.

NATIONAL ASSOCIATION OF COTTON MANUFACTURERS.—80 Federal St., Boston, Mass.

NATIONAL ASSOCIATION OF ELECTRICAL CONTRACTORS AND DEALERS.—15 West 37th St., New York, N. Y.

NATIONAL ASSOCIATION OF ICE INDUSTRIES.—163 W. Washington St., Chicago, Ill.

NATIONAL ASSOCIATION OF MANUFACTURERS OF THE UNITED STATES OF AMERICA.—11 W. 42nd St., New York, N. Y.

NATIONAL ASSOCIATION OF WOOL MANUFACTURERS.—80 Federal St., Boston, Mass.

NATIONAL AUTOMOBILE CHAMBER OF COMMERCE.—366 Madison Ave., New York, N. Y.

NATIONAL ELECTRIC LIGHT ASSOCIATION.—420 Lexington Ave., New York, N. Y.

NATIONAL METAL TRADES ASSOCIATION.—50 Broadway, New York, N. Y.

NEW YORK LUMBER TRADE ASSOCIATION.—5624 Grand Central Terminal, New York, N. Y.

RUBBER ASSOCIATION OF AMERICA, INC.—250 W. 57th St., New York, N. Y.

SILK ASSOCIATION OF AMERICA.—468 Fourth Ave., New York, N. Y.

UNITED STATES BREWERS' ASSOCIATION.—50 Union Square, New York, N. Y.

UNITED TYPOTHETÆ OF AMERICA.—173 W. Madison St., Chicago, Ill.

TRANSPORTATION AND COMMUNICATION

AERIAL LEAGUE OF AMERICA.—280 Madison Ave., New York, N. Y.

AMERICAN ASSOCIATION OF RAILROAD SUPERINTENDENTS.—111 Union Station, St. Louis, Mo.

AMERICAN ELECTRIC RAILWAY ASSOCIATION.—292 Madison Ave., New York, N. Y.

AMERICAN MARINE ASSOCIATION.—414 Washington Street, New York, N. Y.

AMERICAN RAILWAY ASSOCIATION.—30 Vesey St., New York, N. Y.

AMERICAN ROAD BUILDERS' ASSOCIATION.—914 National Press Bldg., Washington, D. C.

AMERICAN STEAMSHIP OWNERS' ASSOCIATION.—11 Broadway, New York, N. Y.

AUTOMOBILE ASSOC. OF AMERICA.—Penn Ave., at 17th St., Washington, D. C.

COMMITTEE ON PUBLIC RELATIONS OF THE EASTERN RAILWAY PRESIDENTS' CONFERENCE.—143 Liberty St., New York, N. Y.

COUNCIL OF AMERICAN SHIPBUILDERS, INC.—50 Broadway, New York, N. Y.

INTERNATIONAL AMATEUR RADIO UNION.—1711 Park St., Hartford, Conn.

INTERNATIONAL FREE TRADE LEAGUE.—Arden, Wilmington, Delaware.

MARITIME ASSOCIATION OF THE PORT OF NEW YORK.—78 Broad St., New York, N. Y.

NATIONAL AERONAUTIC ASSOCIATION.—1623 H. St., N. W., Washington, D. C.

NATIONAL ASSOCIATION OF BROADCASTERS.—1265 Broadway, New York, N. Y.

NATIONAL ASSOCIATION OF OWNERS OF RAILROAD SECURITIES, 11 E. 36th St., New York, N. Y.

NATIONAL COUNCIL OF AMERICAN IMPORTERS AND TRADERS, INC.—45 E. 17th St., New York, N. Y.

NATIONAL HIGHWAY TRAFFIC ASSOCIATION.—12 E. 53rd St., New York, N. Y.

NEW YORK STATE WATERWAYS ASSOCIATION.—1012 Prudential Building, Buffalo, New York.

NORTH AMERICAN EXPORT GRAIN ASSOCIATION, INC.—2 Broadway, New York, N. Y.

RAILWAY BUSINESS ASSOCIATION.—1406 Packard Building, Philadelphia, Pa.

TRAFFIC ASSOCIATION OF AMERICA.—27 William St., New York, N. Y.

TRAFFIC VIGILANCE LEAGUE, INC.—186 Fifth Ave., New York, N. Y.

UNITED STATES SHIP OPERATORS' ASSOCIATION, INC.—149 Broadway, New York, N. Y.

PART FIVE
SOCIAL CONDITIONS AND AIMS

DIVISION XIV
IMMIGRATION, RACES AND POPULATION

RACE CONDITIONS IN THE UNITED STATES

By Harry H. Laughlin

Carnegie Institution of Washington

PRIMARY ASPECTS

Racial Movements and Policies.—There are two primary aspects of the current development of race conditions in the United States. One is the actual movement in relative racial numbers in different sections of the country, and the other is the development of national policy in reference to racial problems. In the first of these aspects there are three outstanding matters which have characterized the year 1928. All of these are economic adjustments to the recent restriction of European immigration, and each presents a new phase of some racial problem.

Mexican Immigration.—The southwestern part of the United States, which is undergoing rapid agricultural and industrial development, is supplying its rising demand for common labor with Mexicans who are now free to come into the United States without quota limitation, and who find ready employment because of the lack of European immigrant competitors.

The following table gives the number of Mexicans legally admitted into the United States since 1921:

Year	Legally Admitted	Departed
1921	29,602	5,512
1922	18,244	5,761
1923	62,704	2,479
1924	87,640	1,878
1925	32,378	1,878
1926	42,634	3,158
1927	80,639	10,954

The Commissioner General of Immigration estimates that on June 30, 1927, there were approximately 1,000,000 Mexican aliens in the United States. This number is made up both of the legal entries above listed and the still greater number who have entered by evading the immigration laws. The Federal Census Reports since 1850 show the following growth of number of persons of Mexican birth in the United States:

1850	13,317
1860	27,466
1870	42,435
1880	68,399
1890	77,853
1900	103,393
1910	221,915
1920	386,418
1927 (Estimated)	1,000,000

The Quota Question.—During the year extensive hearings were held by the Committee on Immigration and Naturalization of the House of Representatives on the Box Bill to apply the quota to Mexico and other countries of the south which would limit Mexican immigration. The matter is still before the Congress of the United States. The issue is being drawn between the employers of labor and those interested in immediate economic development, on the one hand, while on the other hand groups of citizens who look upon the immigrant primarily as a parent of future Americans and favor restricting fu-

ture immigration to selected European stocks.

Filipino Immigration.—The Philippine Islands have a population of over 10,000,000 people and, while not citizens of the United States, the Filipinos have free immigration relations with Hawaii and Continental United States. The immigration of Chinese into the United States was prohibited in 1882; the Hindus in 1917, and the Japanese in 1924. Thus the only considerable remaining Oriental group with free immigration into this country are the people of the Philippine Islands. Within the last two or three years they have come in greatly increasing numbers to the Hawaiian Islands, where they now constitute the greatest group of foreign-born persons, supplanting the Japanese in this respect. They are also arriving on the American Pacific Coast in increasing numbers. The census of 1930 will present the first careful measurement of this new movement, which is now well under way, and which was called into action by the recent restriction of European immigration and the removal of competition by other Orientals.

Negro Migration.—The northward trend of the Southern Negro, which continues to increase, is another logical response to the restriction of European immigration which formerly supplied the industrial centers with common labor. Taking the American Negro as a whole, his northward migration and industrialization appear to have tended to slow down his rate of increase. On the southern plantations the Negro has always reproduced rapidly, but under the northern industrial conditions, he does not seem to be maintaining his high fecundity. The Negro fecundity index for 1920 was .42, while that of the whole white population was .47 and that of the foreign-born white was .71. This would indicate a declining fecundity on the part of the American Negro. This is attributed to his failure to adapt himself biologically to industrial conditions.

Contrasted with the decreasing fecundity of the Negro is the rate of the recent European immigrants who migrated principally to the great cities, and who by their high fecundity proved their high adaptability to American industrial life. Between 1910 and 1920 the Negro population of New York City increased 66 per cent.; in Philadelphia the increase was 59.9 per cent.; Chicago 148 per cent.; Cleveland 308 per cent.; Detroit 612 per cent. It is probable that the peak of this movement is not yet reached. The northward trend of the Negro has developed extensive Negro settlements in the great cities; in Chicago a Negro was elected to the 71st Congress.

IMMIGRATION IN RELATION TO TIME AND FECUNDITY

The Negro.—In considering migration and fecundity, we should again call attention to the fact that only about one-third of a million Negroes were originally imported as slaves; very few came as voluntary immigrants. This foundation stock has increased about thirty times. The Negroes commenced coming shortly after the whites. For every Negro slave that was brought over there were about one hundred white immigrants. The present Negro population of the United States is about thirty times the whole number of imported slaves. The Negro was early seed-stock and was favored by rapid reproduction in early generations.

The White.—The white population of the United States is descended from white immigrants, about 35,000,000 in number. Many of the white immigrants came in later years, and have not as a group, up to the present, increased as rapidly as the blacks. In the United States to-day about three white persons are living for every white person who immigrated into the United States since the founding of the country. Thus the period of immigration is an important factor in the differential peopling of the country. The earlier the immigration—other factors being equal—the more abundant the offspring of the immigrant in the receiving country at any given later period.

This "getting in on the ground floor" is only one factor. It may be offset by later differential fecundity or by later immigration of other races in great numbers. At any rate, the combined factors of the number of original seed-stock, time of immigration, and differential fecundity have worked out so that the negro, who constituted only about 1 per cent of our total immigrant numbers, has increased to about 10 per cent of the country's population; while the white immigrants have increased three times, to become about 90 per cent of the population. Yet the Negro, notwithstanding this, has in absolute numbers gained only 6.5 per cent from 1910 to 1920. During this same period the white stock of the country increased 16 per cent.; a goodly portion of the high rate of increase of the latter being due to the high fecundity of recent immigrants.

URBANIZATION

Effect on the Negro.—The movement toward the urbanization and industrialization of the American Negro will doubtless tend still further toward reducing his reproductive rate. His increase in the north is recruited largely from the southern states. In the industrial cities of the north he seems to lack the successful reproductive properties which he possessed in the south. Whether a change in such rate will come with longer efforts at adaptation remains to be seen. While the great change in the country-to-city drift of the Negro had already begun in the decade 1910-1920, it has risen most rapidly since the latter date, and the census of 1930 will be illuminating in this regard. In 1910 the Negro constituted 6.4 per cent of the country's urban population; in 1920, 6.6 per cent. In 1910 he constituted 14.5 per cent of the nation's rural population, and in 1920, 13.4 per cent.

Effect on the Whites.—While, under present-day American life, industrialization and moving from country to city seem to cut down fecundity of all races, this rule does not seem to hold true for white European immigrants who come to the United States and who have settled largely in our urban industrial centers. Whether their fecundity in America is higher or lower than it was in Europe, where many immigrants were already adapted to crowded if not urban conditions, and whether their high fecundity in America is attributable to their being a selected pioneer class of high fecundity, remains to be seen. At any rate, the fact remains that the foreign-born white women have a very high fecundity index in the United States at the present time.

RACIAL POLICY

Immigration Control.—In the second aspect of racial matters in the United States, which concerns the development of racial policy, it is observed that during 1928 there has been a revival of interest and activity of the American people in attempting to solve their racial problems. The recognition of the importance of the immigration problem first expressed in perfunctory planks in the party platform has reached the point of being one of the four or five major issues of the national political campaign. This is perhaps the outstanding development of the year in reference to policy which may affect the racial fortunes of the American people. Each party began its campaign in 1928 with a standard plank in reference to immigration control, based largely on both economic and humanitarian principles.

Political Planks.—The Democratic platform stated: "Laws which limit immigration must be preserved in full force and effect, but the provisions contained in these laws that separate husbands from their wives and parents from infant children, are inhuman and not essential to the purpose or the efficiency of such laws."

The Republican platform declared: "The Republican party believes that in the interest of both native and foreign-born wage-earners, it is necessary to restrict immigration. Unrestricted immigration would result in widespread unemployment and, in the breakdown of the American

standard of living. Where, however, the law works undue hardship by depriving the immigrant of the comfort and society of those bound by close family ties, such modification should be adopted as will afford relief. We commend Congress for correcting defects for humanitarian reasons and for providing effective systems of examining prospective immigrants in their home countries."

Stand of the Candidates.—As the campaign developed, the candidates were forced to explain their platforms and there was a continuous competition between the two parties to declare for more rigid immigration control in the interests primarily of American wage-earners. It is interesting that neither political party in the campaign stressed the matter of immigrants as breeding-stock so much as the matter of immigrants as competitive wage-earners. In this the two major political parties demonstrably stood behind the Congress and President Coolidge. The keynote of President Coolidge's immigration policy stated that "America must remain American." The Congress in 1924 enacted the Johnson Quota Act designed primarily to carry out the same spirit which prompted the Coolidge declaration. The revival of interest in developing a national immigration policy made substantial headway during the year 1928, but the two political parties are about where Congress was in 1917.

The Quota.—During the year 1928 we have moved far enough beyond the year 1924, the date of the Immigration Quota Act, to cause the latter date to stand in perspective. 1924 fairly marks the turning point when the immigration policy of the American people became primarily biological and only secondarily economic. The act of 1924 restricted total immigration to economic needs, and apportioned those admitted according to the respective numbers of the several races already established here; and it further restricted immigration to persons better endowed with desirable qualities than required by the former standard.

FOR BETTER RACIAL ANALYSIS

1930 Census Plans.—The preparation for the census of 1930 involves plans not only for counting the people, but for analyzing, among other things, their racial composition. Past censuses have provided for valuable data on age, sex and color—White, Black, Oriental, American Indian—but not for particular European descent of each person enumerated. The year 1928 has gathered considerable force for demanding a better racial analysis by the census of 1930.

RACIAL INTEGRITY LAW

Extension in South.—Led by Virginia, the Southern States continue to enact a new racial integrity statute which, among other things, provides a definition of a colored person, so far as legal marriage is concerned, as any one whose ancestors are of Negro blood, Georgia and Alabama recently enacted this new law. This lists, for example, a person with one-sixteenth or one thirty-second part of colored blood as a colored person. The purpose of these statutes, as the name indicates, is to preserve the integrity of the white race. Inasmuch as practically all of the crosses between the white and black races are between white men and black women—and the fecundity of a racial group is determined by the number of women and children in it—there would, under the racial integrity statutes, be no legal possibility of any white woman bearing children with any colored blood. Thus the tendency would be to keep the white race white, and to confine any race crossing between the two races to the illegitimate introduction of white blood into the colored portion of the population.

IMMIGRATION PROBLEMS

By Arthur E. Cook

Assistant to the Secretary of Labor

ANALYSIS OF IMMIGRATION

Admissions and Departures.—In the fiscal year ended June 30, 1928, a total of 500,631 aliens were admitted to the United States, as compared with a total of 538,001 aliens for the previous year. During the fiscal year, 274,356 aliens departed, as compared with 253,508 departures during 1927. Therefore, for the past fiscal year, there was a net gain of 226,275 as compared with a net gain of 284,493 aliens for the year 1927. Of 500,631 aliens admitted, 307,255 were immigrants or newcomers for permanent residence in this country, and 193,376 were either returning from a temporary trip abroad or coming here for a visit. Of the 274,356 aliens who departed from the United States during the past year, 196,899 were aliens who had been here for a short stay or who intended to return to the United States after visiting a foreign country. The remaining 77,457 departed without expressing an intention to return.

About three-fourths of the present-day immigrant aliens are in the prime of life—16 to 44 years of age,—which percentage runs about the same as in the previous fiscal year. Of the immigrants admitted during the year, 230,832 were from 16 to 44 years of age, 49,680 were under 16 years of age and the remaining 26,743 were 45 years of age or over. During the previous fiscal year, the male immigrants outnumbered the female immigrants, 194,163 males and 141,012 females being admitted in that year. Again, during the fiscal year 1928 the males outnumbered the females, 165,977 males and 141,278 females being admitted. However, a number of countries sent more females than males. For instance, Greece sent 410 males and 1,918 females and Italy sent 6,075 males and 11,653 females. Statistics show that most of the countries sending an excess of females over males are located in southern Europe where the quotas are small. The excessive number of females over males is due largely to the fact that many of these females are wives of American citizens and as such are exempt from the quota provisions of the immigration act of 1924.

Immigration Sources.—As in the previous fiscal year, countries from the Western Hemisphere furnished almost half the immigrants admitted, due to the fact that quota restrictions do not apply to most countries in this hemisphere. Immigrants to the number of 73,154 were admitted from Canada and 59,016 from Mexico. These two figures constitute 43 per cent of the total number of immigrants for the year. Europe sent 158,513 immigrants during this year, Germany leading with 45,778, being followed by the Irish Free State with 24,544 and Great Britain with 19,958. Italy sent 17,728 and the combined Scandinavian countries (Denmark, Norway, and Sweden) sent 16,184.

Restrictive Effects.—A study of the following figures will show what a tremendous effect the present restrictive immigration laws have. In a single year prior to the war, and of course prior to the first quota law, which was passed in 1921, immigration exceeded the million mark. A larger number of aliens arrived during individual years in that period from single countries in Europe than now come from the entire Continent of Europe. As an example, in the year 1913 the Russian Empire, as it was then known, contributed 291,040 immigrants to this country, Italy 265,542, and the former Austria-Hungary 254,825, whereas in the fiscal year just passed only 158,513 alien immigrants were admitted from all European countries.

CHINESE ALIENS

The number of Chinese admitted during the year was 7,996, of which

number 931 were immigrants and 7,065 non-immigrants. Of the latter number, 4,653 were passing in transit through the United States and 398 were entering as temporary visitors. In the previous fiscal year 8,305 were admitted, 1,051 being immigrants and 7,254 being non immigrants. It will be seen, therefore, that there was a slightly less number of Chinese aliens who came to the United States during the past year than during the preceding year. Chinese numbering 9,357 departed during the past year as compared with 9,881 the previous year.

The main problem in connection with Chinese immigration has to do, not with alien Chinese, but with Chinese who claim American citizenship. While a considerable number of alleged citizens claiming birth in the United States apply for readmission, for the most part citizen applicants are those who claim to be citizens by reason of the birth of their alleged fathers in this country. There applied for admission during the fiscal year 3,352 Chinese who claimed citizenship, as against 3,276 of this class who applied for admission during the fiscal year 1927. In order to determine the truth of the claims of these applicants, the Immigration authorities are confronted with the difficult task of determining the relationship of an applicant to his alleged father when birth is said to have occurred in China.

Chinese immigration, within the past few years, has reached the stage in point of time when the grandchildren of Chinese who were born in the United States are applying for admission in considerable number. The Department of Labor took the position that the son of the son of a person born in the United States was not a citizen if at the time of the birth of such grandson of a native-born citizen, his father had never resided in the United States. The matter was carried to the Supreme Court in the case of Chin Bow *v.* United States, and a few days before the beginning of the fiscal year 1928 the Supreme Court upheld the Government's position that such persons were not citizens. The effect of this decision is to prevent the immigration of many Chinese who otherwise would have been eligible for admission regardless of any law governing the admission of aliens.

DEPORTATION OF ALIENS

The expulsion of undesirable aliens from the country continues to be one of the most important functions of the Immigration Service. The classes of aliens subject to deportation include criminals, anarchists, insane and feeble-minded aliens, aliens who have become public charges, and the like. During the past fiscal year a total of 11,625 aliens were arrested and formally deported, as compared with 11,662 for the preceding year and 10,904 for the fiscal year ending June 30, 1926. Of the past year's 11,625 deportees, 5,021 were deported to Europe, 2,511 to Canada, 2,934 to Mexico, 532 to other countries of the Western Hemisphere, 529 to Asia, and 98 to Africa, Australia, and the Pacific Islands.

The number of aliens deported for the past year was slightly less than the number deported for the previous year, during which year the number of deportations was the largest ever handled by the Immigration Service in a single year. However, it will be noted that the number deported during the past fiscal year greatly exceeded the total of 10,904 aliens deported for the fiscal year ending June 30, 1926. In addition to the 11,625 aliens actually deported, there were 19,946 subject to deportation who departed in order to avoid formal deportation, as compared with 15,012 such departures for the previous year. From this, it will be seen that the total number of deportable aliens whose removal from the country was brought about during the past fiscal year exceeded by 4,897 the number of such departures during the previous fiscal year, which, in effect, means that in the fiscal year just passed the Immigration Service was responsible for the removal from the country of more deportable aliens than during any other previous fiscal year.

BORDER PROBLEMS

Arrests and Seizures.—The immigration border patrol apprehended 25,534 persons of all kinds found engaged in unlawful or questionable activities. Of these 23,896 were turned over to examiners of the Immigration Service, of which 18,000 were smuggled aliens and 330 were found to be smugglers of aliens. There were turned over to the customs service 871 persons; to the Prohibition Unit, 105 persons; to State and municipal authorities, 538; and to other branches of the Government, 124 persons. Seizures were made of 671 automobiles at an estimated value of $291,919, and of 314 other conveyances at an estimated value of $69,802. Liquor aggregating 353,392 quarts estimated at a value of $386,692, and miscellaneous contraband goods valued at $25,451 were seized by patrolmen and delivered to the appropriate governmental agencies concerned.

Law Enforcement.—The difficulties of enforcement of the immigration laws on the land borders are increased by the millions of legitimate "border crossers," estimated at about forty million a year. After the passage of the immigration act of May 26, 1924, putting further restrictions on the admission of aliens, with added documentary requirements, it was decided by the Secretary of Labor that additional regulations would have to be made to enforce the law at inland points of entry. Impetus was given to this decision by increasing protests by labor and mercantile interests against conditions at Detroit and Buffalo. After careful consideration General Order No. 86 was issued on April 1, 1927, whereby after a reasonable time aliens who had been enjoying the so-called "border crossing" privilege for purposes of employment in the United States, were to be considered as immigrants on payment of head tax and their entry into the United States legalized and made a matter of record, regard being held for the provisions as to admission as quota and non-quota aliens under the quota acts of 1921 and 1922. Aliens who came within the provisions of the 1924 immigration act were given a certain time in which to obtain immigration visas if of the class designated in that act as "quota immigrants."

Court Decisions.—A determined effort was made to break down the application of General Order No. 86, however, and aliens from European countries residing in Canada were used to test this order in court. In the initial cases at Buffalo and Detroit, the Federal district courts decided in favor of the Government, but on appeal to the Circuit Court of Appeals for the Second Circuit that court held in the case of Mary Cook and Antonio Danelon *v.* Karnuth that the order of the department was void and of no effect, deciding that aliens coming to look for work or to continue to work in this country and returning each day to a home in Canada were not immigrants, but were within the exemption of section 3 (2) of the 1924 immigration act as aliens visiting the United States temporarily as tourists, or temporarily for business or pleasure. The court held, also, as to the same aliens, that they were entitled so to enter the United States under that provision of the Jay treaty of 1794 which granted the right to "His Majesty's subjects and to the citizens of the United States, and also to the Indians dwelling on either side of the said boundary line freely to pass and repass" the Canadian border.

Canadian Case.—Following this decision of the circuit court of appeals for that circuit, the district court extended its application by holding that any person residing in Canada is a British subject. It becomes apparent that, if these decisions are upheld, it will be impossible to prevent the entrance into the United States of aliens of any race or color from any part of the world who may gain entry into Canada. The case is now pending, awaiting a decision of the United States Supreme Court as to whether that tribunal will review it. The Secretary of Labor states, "If its decision is against the Government, then the present restrictive immigration law will no longer be of

any effect as a protection to the wage earner of the United States against alien labor of foreign countries, whether Canadian, Mexican, or European."

LEGISLATION

Family Considerations.—The hardships of separated families when certain members left Europe for America, are gradually being wiped out by reunion in the United States. Many cases have been automatically cared for by placing them within the regular quota classes; and privileges have been granted to certain members of American citizen families. May 29, 1928, an act was passed giving preference also to wives and minor children of legally resident aliens, and non-quota status to husbands of American citizens married prior to June 1, 1928. The non-quota age limit for children of American citizens, and preference for children of skilled agriculturists was raised from eighteen and sixteen years to twenty-one and eighteen years respectively.

American Indians born in Canada were exempted from bar as aliens "ineligible to citizenship," by act of April 2, 1928.

The 2% of the census of 1890 was retained for another year by postponing the effective date of the "national origin" provision through act of March 31, 1928.

Selective Principle.—The Secretary of Labor recommended to Congress an extension of the selective principle of immigration by preferences to certain needed workers and to relieve difficult circumstances in family life which cannot otherwise be remedied, such preferences to be established and allowed in the United States after full investigation; authority, under certain circumstances, to legalize residence of aliens arriving before quota restrictions, where no record of entry exists. He also suggested that experimentally examinations by Public Health, Customs and Immigration officers might be undertaken aboard the largest liners while they are *en route* from Europe to America to avoid the confusion and delay frequently experienced upon the entry and arrival of ships at American ports.

Amendments.— The Commissioner General of Immigration has suggested twenty-one amendments to the laws, principally for administrative facility, but also including repeal of the national origin provision, more liberality towards aged parents of citizens, stepchildren of American citizens, and political refugees, geniuses, etc.

POPULATION AND IMMIGRATION

Problems of population, according to the Secretary of Labor, would before long confront the American people if proper concern were not had for the effects of immigration and the rapidly growing application of machines to industrial and agricultural production. Analysis of population growth during the past century show startling results in percentages: European countries increased by approximately 100% while supplying the basis for the greater portion of America's present population; Japan doubled the number of her people in about fifty years. If the same ratio should be continued for another two centuries, the density of population in the United States would equal about eight times the now most heavily populated countries of Europe, and would be twice what it would then be in such other countries if they maintained their respective rates. Secretary James J. Davis believes that the present policy of restriction is a step toward prevention of over-rapid population growth.

THE QUOTA SYSTEM

By Harry E. Hull

Commissioner General of Immigration, Department of Labor

LEGISLATION

Amendatory Acts.—The first Quota Act was passed on May 19, 1921. Theretofore there never were numerical restriction provisions in the immigration laws. The quota act of 1921 provided that the number of aliens of any nationality who could be admitted under the immigration laws in any fiscal year should be limited to three per cent of the number of foreign born persons of such nationality resident in the United States as determined by the United States Census of 1910. There were some few exceptions to this provision. In 1922 the act was amended to some extent, which in effect lessened the number which could come, though not changing the numerical provision. In 1924 the act was drastically amended. In this act the quota was based on two per cent of the foreign born individuals of any nationality resident in continental United States as determined by the Census of 1890, thus greatly reducing the number allowed to come under the 1921 act as amended.

The Family Entity.—The first Quota Act made certain provisions to keep families intact. However, since the passage of that act Congress has, by frequent amendments, added provisos to the immigration laws in order to prevent, as far as possible, the separation of families. The most recent legislation along these lines was passed on May 26, 1928. Under this act additional classes were added to those designed to preserve the family entity. As an example, a nonquota status was extended to the husband of a citizen of the United States where marriage occurred prior to June 1, 1928; the age of unmarried children of citizens accorded a nonquota status was extended from 18 to 21 years; and a woman who was a citizen of the United States and who prior to September 22, 1922, lost her citizenship by reason of marriage to an alien, but at the time of her application for an immigration visa is unmarried, was likewise granted a nonquota status. The classes of aliens who are entitled to preference in the issuance of immigration visas were increased. As an example, a new preference class was provided to cover the wife and unmarried children under 21 years of age of alien residents of the United States who were lawfully admitted to the United States for permanent residence.

Indian Provisions.—On April 2nd, 1928, an act was passed to the effect that the provision of law in the immigration act of 1924 excluding, with certain exceptions, those ineligible to citizenship, should have no application to the right of American Indians born in Canada to cross the borders of the United States. This act does not extend to persons whose membership in Indian tribes or families was created by adoption. On March 21, 1928, an act was passed postponing the adoption of the national origin quota plan until 1929 and keeping in effect the present quota plan.

EFFECT OF THE QUOTA LAW

Admissions.—A glance at immigration statistics at once shows what a tremendous effect the quota law has upon immigration. During the past fiscal year (July 1, 1927, to June 30, 1928) approximately 500,000 aliens were admitted to the United States and of this number about 193,000 were either returning from a temporary trip abroad or coming here for a visit, thus, approximately 307,000 immigrants were admitted to the United States. In the year 1907, 1,123,842 aliens were admitted to this country. In 1913, 1,044,457 came, and in 1914, 1,008,750 were admitted.

Deportations.—The expulsion of undesirable aliens from the country is

one of the most important functions of the Immigration Service. The classes of aliens subject to deportation include criminals, anarchists, insane and feeble-minded aliens, aliens who have become public charges, and the like. During the past fiscal year the total of 11,625 aliens were arrested and formally deported. In addition to this number of aliens who were actually deported, there were approximately 20,000 subject to deportation who departed in order to avoid formal deportation. Therefore, it will be seen that the Immigration Service was responsible for the enforced departure from the country of approximately 32,000 aliens.

Immigration Return Permits.—The Immigration Act of 1924 provides that alien immigrants lawfully admitted to the United States for permanent residence may return to this country after a temporary visit abroad without being charged to a quota. In order to facilitate the entry of such persons without the necessity of obtaining nonquota immigration visas from consular officers, there is a provision in the act whereby such aliens may secure in advance of their departure from the United States a reentry permit. During the past fiscal year 113,977 permits were granted. In addition to this 10,731 extensions to permits were granted, making a total of 124,708 permits and extensions.

Border Patrol.—The passage of the Quota Act did not, of course, lessen the desire of aliens located in all parts of the world to continue to come to the United States. The conclusion was reached (which was later justified) that vast hordes of aliens who were unable to come in under the newly established quotas would endeavor to gain unlawful entries, principally across the inadequately guarded land borders. The then existing force of immigrant inspectors was entirely too small successfully to cope with such a problem. Accordingly, a branch of the Service known as the Border Patrol was formed. Beginning July 1, 1924, with a personnel of 472 employees the organization has been expanded to a total of 747 members consisting of one supervisor, six assistant superintendents, 28 chief patrol inspectors, 166 senior patrol inspectors, 504 patrol inspectors, 15 motor mechanics, 22 clerks, 3 laborers, and 2 janitors. Transportation equipment consists of 267 automobiles and 13 trucks. In addition to these, 15 saddle horses and 7 pack horses are provided.

The outstanding accomplishment of the immigration border patrol for the past fiscal year shows the apprehension of 25,534 persons of all kinds found engaged in unlawful activities. Of this number 23,896 were turned over by patrol officers to examiners of the immigration service. Out of this total approximately 18,000 were smuggled aliens and 330 were found to be smugglers of aliens. There were turned over to the customs service 871 persons to the prohibition unit, 105 persons; to state and municipal authorities 531 persons; and to other branches of the Government service 124 persons. Seizures were made of 671 automobiles with an estimated value of $291,919 and of 314 other conveyances at an estimated value of $69,802. Liquor aggregating 353,392 quarts estimated at a value of $386,692 and miscellaneous contraband goods estimated at $25,451 were seized by patrolmen and delivered to the appropriate Government Agencies concerned.

In the preceding fiscal year 12,098 smuggled aliens were apprehended. The past fiscal year witnessed an increase of 50% in the number of such aliens taken into custody. In the four years of the organization's existence seven border patrolmen have lost their lives in encounters with outlaws, two of the fatalities having occurred during the past fiscal year. Of course, the figures herein set forth do not represent the real value of this organization to the country. The real value of a force of this nature is derived from the fact that it acts as a deterrent to law violators. In other words, if it were not for the existence of an organization of this nature, aliens in unlimited numbers could enter the country without complying with the immigration laws. Therefore, in determining the value

of such an organization not only the actual visible results must be kept in mind, but, as just stated, the thought of what would happen without the existence of such a force must be considered.

CITIZENSHIP AND NATURALIZATION

By Raymond F. Crist

U. S. Commissioner of Naturalization

CITIZENSHIP AND ITS ACQUIREMENT

Constitutional Authority.—The fundamental authority for citizenship in the United States rests upon two provisions in the Constitution. It is interesting to note that the Constitution as originally adopted does not specifically define the status of citizenship of persons of native birth, while it empowers Congress (Article I, Section 8, clause 4) "to establish an uniform rule of naturalization," thereby insuring definition of the course and status of citizens by naturalization. Not until July 28, 1868, was the status of a native-born citizen brought within the safeguarding provisions of the Constitution. Amendment XIV, Section I, declares: "All persons born or naturalized in the United States, and subject to the jurisdiction thereof, are citizens of the United States and of the State wherein they reside." This action also gave Constitutional recognition to the status of all naturalized citizens admitted to the body politic pursuant to specific acts of Congress passed from time to time, beginning with the act of the First Congress under the Constitution on March 26, 1790. Subsequent enactments have aimed to modify the uniform rule of naturalization in such a manner as to meet the changing conditions arising after the original enactment.

In 1868, just prior to the adoption of the Fourteenth Amendment, Congress, by a statute, declared expatriation to be a natural and inherent right of the individual, and one indispensable to the enjoyment of those rights to life, liberty and the pursuit of happiness which are fundamental to this Government. Likewise, that all naturalized citizens of the United States shall be entitled to and shall receive from the Government of the United States the same protection of person and property as that accorded to native-born citizens while in foreign states in like circumstances and situations.

The status of citizenship by naturalization is a conditional one, both under the provisions of the Constitution and the statutes applicable thereto. Presumption of expatriation by a naturalized citizen may ensue upon an absence of two years from the United States with residence in the state of former allegiance, or upon five years' absence in any other foreign state. Likewise, fraud in the naturalization is presumed if the newly naturalized citizen shall establish a permanent foreign residence within five years of acquisition of American citizenship. Citizenship will terminate, whether the individual be native or naturalized, upon the taking of an oath of allegiance to any foreign sovereignty, notwithstanding that foreign citizenship shall not vest consequent upon that act. Likewise expatriation follows acquisition of full foreign citizenship.

Process of Acquiring Citizenship.—Citizenship has been quite uniformly conferred in the United States by a judicial process; when so conferred the judicial proceeding is a case within the meaning of the Constitution. Citizenship has, however, been collectively conferred by Congress upon large numbers through its treaty-making powers in the acquisition of territory, and upon the admission of portions of such acquired territory to statehood. Citizenship has also been conferred upon the inhabitants of acquired territory by legislative enactments in the absence of definite treaty stipulations and prior to

admission to statehood. Native-born American Indians were admitted to citizenship through tribal treaties prior to 1871, and by the act of June 2, 1924 (43 Stat. 253), all native Indians were given citizenship.

MACHINERY AND NATURALIZATION

Limitations.—Naturalization is not open to all races but is limited to those who come within the language of Section 2169 of the Revised Statutes of the United States; "aliens being free white persons and those of African nativity and to persons of African descent." Under these limitations the acts of June 29, 1906 (34 Stat. 596), and September 22, 1922 (42 Stat. 1021), confine the field of operation.

Canal Zone and Philippine Islands.—Naturalization is not conferred in the Philippine Islands, the Canal Zone, nor any of the insular possessions. Citizens of the Philippine Islands are not citizens of the United States but owe allegiance thereto. Citizenship in the Philippine Islands is conferred upon aliens resident in those islands under the Philippine naturalization law of 1920.

Judicial Jurisdiction.—Congress has conferred jurisdiction to administer the naturalization law upon State Courts which have a seal and clerk and jurisdiction in actions at law or equity, or law and equity, in which the amount in controversy is unlimited. These State Courts are thereby made Federal agencies with jurisdiction coördinate with that of the District Courts of the United States. Courts of the Territories of Alaska and Hawaii of like territorial jurisdiction have been similarly empowered by Congress. In Porto Rico the United States District Court has had jurisdiction since March 2, 1917. The District Court of the Virgin Islands was clothed with similar jurisdiction on February 25, 1927, when Congress conferred United States citizenship upon certain inhabitants of the Virgin Islands and extended the naturalization laws to those islands. In the naturalization proceedings in all of these courts the United States is represented by appointees of the Secretary of Labor on the recommendation of the Commissioner of Naturalization.

Bureau of Naturalization.—The administration of these and some minor acts which comprise the entire naturalization code is reposed in a central Federal Bureau of Naturalization, in the Department of Labor. This Bureau accomplishes the administration of these laws through the agency of a Field Naturalization Service with branches located in 27 cities strategically selected throughout the United States, subject to the direction of the Commissioner of Naturalization from the administrative headquarters in Washington.

PROCESS OF NATURALIZATION

Alien Population.—The naturalization problem in this country is the largest and most complicated of any like problem in any other country and larger probably than in all other countries combined. This problem arises out of the millions of persons of foreign birth who have sought the opportunities which this country offers through its wonderful resources. The Census Report for 1920 is the latest available authority for the alien-born persons in the United States. At that time they numbered 13,920,692, including men, women, and children, of whom the unnaturalized were shown to be 5,398,605, not included in this total 1,223,490 who had taken the first step towards citizenship by securing their "first papers." These two groups aggregated 6,622,095, or nearly one-half of the foreign born. As somewhat uncertainly connected in the problem were 805,509 individuals regarding whose citizenship status it was impossible to ascertain whether or not they had divested themselves of their foreign allegiance. Assembling these three groups together, the total of 7,427,604 leaves 6,493,088 persons who had acquired citizenship,—less than one-half of the total foreign population.

Naturalization Procedure.—Citizenship as ordinarily conferred upon persons of foreign birth is by judicial procedure. The first step in this proceeding is, however, ministerial, and

consists in taking out the first paper, or declaring an intention to become a citizen of the United States within seven years from the date of such declaration. This action occurs in any of the courts empowered to naturalize aliens within whose jurisdiction the alien may reside. The final step is filing the petition to the court for admission to citizenship and the hearing of the petition by the court. If granted citizenship by the court, the petitioner is required to abjure all allegiance by name to the sovereignty of which he is a citizen or subject and all others in general and to take the oath of allegiance to the United States. A certificate of citizenship is issued to the new citizen and is popularly known as the "second paper."

Residential Requirements.—A person of foreign birth must be admitted to the United States as an immigrant for a permanent residence. Five years after such admission, if at that time the individual should be possessed of a declaration of intention made by him at least two years earlier, he may proceed to file his petition for naturalization. He must obtain from the Department of Labor a certificate showing the date, place, and manner of his arrival in the United States. This certificate is issued from the record made by the immigration authorities at the time of arrival. The petition for naturalization must be completed by two citizens of the United States who serve as witnesses and testify as to the residence and good moral character of the petitioner during the five-year period immediatley preceding the date of the petition. If all of the five years of residence has not been within the state where he then resides, any portion of the first four years of residence outside of that state may be established by depositions of American citizens at the places where they reside.

A petition filed under the general provisions of the naturalization law may not be heard until after 90 days from the date it is filed. In addition to this, it must be posted publicly for a like period, with the date, as near as may be shown, for the hearing of the petition. There are some exceptions to these general provisions which favor soldiers, sailors, enlisted men in the Navy and the Marine Corps, in whose behalf Congress has permitted the filing of petitions in any convenient court and to have them come on for summary hearing if the applicants have been examined by the Naturalization Service on behalf of the United States Government. Naturalization is prohibited during the 30 days preceding the holding of an election general to the jurisdiction of the court.

NATURALIZED PERSONS

(Fiscal Year 1927-28)

Country	Number	
Repatriated Americans		3,747
Italy		53,210
British Empire:		
Ireland	13,183	
England	9,127	
Canada	7,712	
Scotland	4,486	
Wales	404	
Australia	163	
Others	3,078	
Total British Empire		38,156
Poland		35,295
Russia		17,939
Czechoslovakia		10,555
Germany		9,413
Greece		9,014
Serbs, Croats and Slovenes		6,676
Rumania		6,386
Hungary		5,981
Turkey		5,022
Sweden		4,615
Austria		4,239
Lithuania		3,767
Norway		2,614
Holland		2,011
Switzerland		1,992
Denmark		1,862
Finland		1,524
Belgium		1,358
Syria and Lebanon		1,343
France		1,307
Portugal		1,009
Spain		800
Bulgaria		352
Luxemburg		132
Mexico		122
Miscellaneous		2,325
Total		233,155

Petitions and Grants.—Up to and including June 30, 1928, there have been 5,579,462 declarations of intention made by candidates for citizenship, and 2,619,790 certificates of naturalization granted upon the 3,061,027 petitions for naturalization filed by applicants for citizenship since the

act of June 29, 1906, became operative. During the year 1928, there were 254,588 declarations of intention made by persons of foreign birth, of which 198,551 were by men and 56,037 by women. A total of 240,321 petitioned for admission to citizenship, 184,867 petitions being made by men and 55,454 by women. 233,155 persons received certificates of citizenship; out of these 51,280 were women, this constituting the largest record of naturalization of women in any year in the history of the administration of the naturalization law.

SPECIAL CASES

Naturalization of Women.—On September 22, 1922, Congress passed a law which required women to become citizens independently of the action of their husbands. This law repealed the provisions of the laws by which the wife became a citizen upon the naturalization of her husband and by which she lost her citizenship upon marriage to an alien. Since that time 291,464 women have made the declaration of intention to become citizens of the United States. 179,485 women filed petitions for naturalization and 149,379 have been admitted to citizenship, of whom 51,280, or over one-third, were naturalized in 1928.

Exemptions of World War Veterans.—On May 25, 1928, the Act of Congress expired which was passed two years before, giving exemptions to veterans of the United States military forces of the World War. Under this act there were 9,552 soldiers who received citizenship during its lifetime. During the year 1928 there were 5,149 naturalized, and these, together with the 293,086 previously naturalized under the war time legislative exemptions, bring the total up to 298,235 veterans of the World War American forces who received special recognition leading to their citizenship.

IMMIGRATION VISAS

The Immigration Act of 1924 requires each immigrant to obtain an immigration visa in the country from which he departs before departing for the United States for permanent residence. These visas are in the custody of the Bureau of Naturalization and constitute records to which reference is made to prove the claim of legal admission that will entitle an alien who arrived in the United States on or after July 1, 1924, to proceed to naturalization. There were 313,057 visas received in the Bureau of Naturalization in 1928, which, added to those previously received, made a total of 1,247,582.

CITIZENSHIP TRAINING

The Federal Textbook on Citizenship Training has been prepared to provide a complete course of study for adults of foreign birth, leading from appropriate elementary English lessons to a brief history of the United States with special reference to the form of government, and including practical lessons on citizenship in local communities. It is furnished to candidates for naturalization who attend public school classes. Public School officials in 381 communities submitted information regarding enrollment of this class of students and requested appropriate textbooks during the year 1928, the number furnished being as follows: Part I, Our Language, 13,150; Part II, Our Community, 10,808; Part III, Our Nation, 9,299.

LEGISLATION

No final enactments emanated from Congress in the fiscal year 1928, though several important bills were introduced into the two Houses of Congress. Two of these bills have for their object the codification of the naturalization law, dividing it into four major parts or titles: "Naturalization in General," "Naturalization in Special Cases," "Cancellation Proceedings," and "Miscellaneous Administrative Provisions." These bills have not been reported out of their respective Congressional Committees.

Other bills were introduced to accomplish certain of the objects embodied in the two major bills. Two of these special bills were reported by the appropriate committee and

one of them (H. R. 349) was passed by the House of Representatives on December 19, 1927, and referred to the Immigration Committee of the Senate. The other bill (H. R. 13793) was reported to the House of Representatives on May 19, 1928, and it is now upon the Union Calendar. The first of these bills provides for a simplification of the requirements regarding proof of residence by an applicant for citizenship within the United States. The second bill proposes a method by establishing a record and issuing a certificate showing the date, place and manner of arrival in the United States to enable such aliens to proceed to naturalization Other provisions would require photographs to be attached to naturalization papers, would cause the issue of certificates of naturalization to all foreign-born citizens of the United States, would increase naturalization fees to a rate more commensurate with the cost of the naturalization proceedings, and would require that an alien read, speak, and write in the English language in order to become a citizen.

POPULATION STATISTICS

By Leon E. Truesdell

Chief Statistician for Population, Bureau of the Census

CONTINENTAL UNITED STATES

Summary of Census Figures.—The growth of the population since the first census in 1790 is indicated by the following table, which gives the figures for each census, with the estimate for July 1, 1928:

POPULATION OF THE UNITED STATES

1790 to 1928

Year	Population	Increase Over Preceding Census	
		Number	Per Cent
1790	3,929,214	...	...
1800	5,308,483	1,379,269	35.1
1810	7,239,881	1,931,398	36.4
1820	9,638,453	2,398,572	33.1
1830	12,866,020	3,227,567	33.5
1840	17,069,453	4,203,433	32.7
1850	23,191,876	6,122,423	35.9
1860	31,443,321	8,251,445	35.6
1870	38,558,371	7,115,050	22.6
1880	50,155,783	11,597,412	30.1
1890	62,947,714	12,791,931	25.5
1900	75,994,575	13,046,861	20.7
1910	91,972,266	15,977,691	21.0
1920	105,710,620	13,738,354	14.9
1928	120,013,000	14,302,380	13.5

Population Growth.—The estimated population of Continental United States on July 1, 1928, was 120,013,000, as compared with 105,710,620 on January 1, 1920, the date of the last actual census of population. This estimate represents an increase of 13.5 per cent for the period of 8½ years, which would be equivalent to 16.1 per cent in 10 years. The increase for the period between the censuses of 1910 and 1920 amounted to 14.9 per cent (equivalent to 15.4 per cent in a complete decade).

BIRTHS AND DEATHS

Registration Area.—Among the most fundamental of the current statistics relating to population are those of births and deaths. Neither birth registration nor death registration has yet reached such a stage of development in all of the states of the Union that the figures are considered satisfactory for compilation by the Census Bureau. The registration area, which is made up of those states having satisfactory registration systems, is being gradually extended, however, until it now includes all but 4 of the states and about 95 per cent of the population. Beginning with 1925, it has been considered that the returns for births and deaths were sufficiently complete to justify their use as a basis for estimating the increase from year to year in the population of the United States.

Summary of Recent Data.—The following table gives for each year from 1920 to 1927 the number of births

and deaths, the annual rates per 1,000 of the population, and a 3 year moving average rate, which indicates the trend with much less variation from fortuitous conditions than the single year rates:

BIRTHS AND DEATHS IN THE REGISTRATION AREA: 1920 to 1927.

(The birth registration area included 59.8 per cent of the total population of the country in 1920 and 87.3 per cent in 1927; the death registration area included 82.2 per cent of the population in 1920 and 91.3 per cent in 1927.)

Year	Births			Deaths		
	Number	Rate per 1,000 of the Population		Number	Rate per 1,000 of the Population	
		Annual	3-year Moving Average		Annual	3-year Moving Average
1920	1,508,874	23.7	...	1,142,558	13.1	...
1921	1,714,261	24.3	23.5	1,032,009	11.6	12.2
1922	1,774,911	22.5	23.1	1,101,863	11.8	11.9
1923	1,792,646	22.4	22.5	1,193,017	12.3	12.0
1924	1,930,614	22.6	22.2	1,173,990	11.8	12.0
1925	1,878,880	21.4	21.6	1,219,019	11.8	12.0
1926	1,856,068	20.6	20.9	1,285,927	12.2	11.8
1927	2,137,836	20.6	...	1,236,949	11.4	...

FUTURE POPULATION GROWTH

Indications from Present Rates of Increase.—There is much current interest in the probable growth of the population of the United States over a considerable period, though the relations between this growth and such problems as that of the farm surplus constitute a field as yet little exploited. If the present rate of growth of around 1½ per cent per year should be maintained, the population of the country would reach 300,000,000 in about 65 years. If the present arithmetic addition of approximately 1,500,000 per year were maintained for the same period, the resulting population would be about 220,000,000. Experts attacking the problem by at least two distinct methods have reached the conclusion, however, that before the end of the present century our population will have almost ceased to grow and that it will become nearly stationary somewhere between 180,000,000 and 190,000,000.

Declining Rate of Natural Increase.—Any forecast of the population for even a moderate way into the future must be affected seriously by recent trends in the birth and death rates, especially in the birth rate, which has decreased from 23.7 in 1920 to 20.6 in 1927. The death rate has also declined, though not as much, and as a net result the rate of natural increase (birth rate minus death rate) has declined from 11 per 1,000 in 1920 to 9.2 in 1927. The present low death rate (11.4 in 1927) cannot be long maintained, however, in view of the fact that the population is rather rapidly increasing in average age. In 1870 children under 10 years of age formed 39.2 per cent of the population; in 1920 only 31.7 per cent. In 1870 persons 65 years of age and over formed only 14.9 per cent of the population; in 1920, 20.8 per cent. The median age in 1870 was 20.1 years; in 1920, 25.2 years. The birth rate is likewise somewhat favored by an age distribution in which the percentage of persons in the reproductive ages (20 to 45 years) is greater than is likely to be long maintained. The rate of natural increase, therefore, is almost sure to be cut into in the near future both by a decreasing birth rate and by an increasing death rate.

POPULATION CLASSIFICATIONS

Urban.—The published reports of the population census show the figures classified under about 20 different headings, of which space will

permit the presentation here of only a few. Of the total population in 1920 (105,710,620), 51.4 per cent were living in urban territory, which comprises all cities and other incorporated places having 2,500 inhabitants or more; and 48.6 per cent were living in rural territory; that is, outside such incorporated places. The percentage urban in 1880, when this classification was first established, was only 28.6.

Rural.—The farm population, which was first shown separately in 1920, numbered 31,614,269, representing 29.9 per cent of the total population and 61.5 per cent of the rural population. The 1920 figure included certain farm laborers (and their families) not actually living on farms, estimated to number about 600,000. The farm-resident population in 1925, as returned in the farm census of that year, numbered 28,981,668, representing a decrease of about 2,000,000 as compared with 1920. Estimates made by the Department of Agriculture indicate that the decrease in the farm population has continued rather rapidly since 1925.

Sex, Age and Race.—Other important classifications of the 1920 population of the United States are as follows: by sex, 53,900,437 males, and 51,810,189 females; by race, 94,820,915 white, 10,463,131 negro, and 426,574 other races; by age, under 5 years 11,573,230, 5 to 14 years 22,039,212, 15 to 24 years 18,707,577, 25 to 44 years 31,278,522, 45 to 64 years 17,030,165, 65 years and over 4,933,215, and age not reported 148,699; white population by nativity, native white of native parentage 58,421,957, native white of foreign or mixed parentage 22,686,204, and foreign-born white 13,712,754.

MARRIAGE AND DIVORCE

Data.—Marriage and divorce figures have been compiled for various periods beginning with 1867 and have been published annually beginning with 1922. The following table summarizes the returns from 1922 to 1927:

MARRIAGES AND DIVORCES IN THE UNITED STATES:
1920 to 1927

Year	Population (estimated as of July 1)	Marriages		Divorces		
		Number	Per 1,000 of Population	Number	Per 1,000 of Population	Per 100 Marriages Performed
1927	118,628,000	1,201,053	10.12	192,037	1.62	16.0
1926	117,136,000	1,202,574	10.27	180,853	1.54	15.0
1925	115,378,000	1,188,334	10.30	175,449	1.52	14.8
1924	113,727,000	1,184,574	10.42	170,952	1.50	14.4
1923	111,693,000	1,229,784	11.01	165,096	1.48	13.4
1922	109,893,000	1,134,151	10.32	148,815	1.35	13.1

The number of marriages per thousand of the population shows a gradual though not very rapid decrease. The number of divorces per thousand of the population, on the other hand, shows a continuous increase.

Classification of Divorces.—The divorces, as reported, are classified according to cause, party to whom granted, etc. Of the 188,685 divorces granted in 1927 for which detailed information was received 54,637 were granted to the husband and 134,048 to the wife. Classified according to cause: 16,658 were granted for adultery, 77,036 for cruelty, 58,421 for desertion, 3,216 for drunkenness, 7,840 for neglect to provide, and 25,514 for other causes and combinations of causes. Of the whole number of divorces, 163,370 were reported as uncontested. Cases where the parties had been married less than 5 years formed 37.7 per cent of the divorces and another 29.5 per cent was made up of cases where the parties had been married from 5 to 9 years. In only 68,949 cases, or 36.5 per cent of the total, was it reported that children were affected by the divorce.

COGNATE SOCIETIES

AMERICAN COLONIZATION SOCIETY.—516 Colorado Building, Washington, D. C.

CITIES CENSUS COMMITTEE.—200 Fifth Ave., New York, N. Y.

CITIZENS' COMMITTEE OF ONE THOUSAND.—100 Fifth Ave., New York, N. Y.

LEAGUE OF FOREIGN BORN CITIZENS.—342 Madison Ave., New York, N. Y.

NATIONAL LIBERAL IMMIGRATION LEAGUE.—128 Madison Ave., New York, N. Y.

NATURALIZATION AID LEAGUE.—175 E. Broadway, New York, N. Y.

NORTH AMERICAN CIVIC LEAGUE FOR IMMIGRANTS.—289 Fourth Ave., New York, N. Y.

TRADE UNION IMMIGRATION BUREAU.—201 Second Ave., New York, N. Y.

RACES

ALLIED CITIZENS OF AMERICA, INC.—370 Seventh Ave., New York, N. Y.

AMERICAN ETHNOLOGICAL SOCIETY.—American Museum of Natural History, New York, N. Y.

AMERICAN INDIAN DEFENCE ASSOCIATION, INC.—221 W. 57th St., New York, N. Y.

AMERICAN INDIAN LEAGUE.—24 E. 74th St., New York, N. Y.

AMERICAN JEWISH COMMITTEE.—171 Madison Ave., New York, N. Y.

AMERICAN SCANDINAVIAN FOUNDATION.—25 W. 45th St., New York, N. Y.

AMERICAN UNION OF ROUMANIAN JEWS.—799 Broadway, New York, N. Y.

ASSOCIATION GENERALE DES ALSACIENS-LORRAINS D'AMERIQUE.—46 W. 46th St., New York, N. Y.

ANCIENT ORDER OF HIBERNIANS.—937 W. 54th Place, Chicago, Ill.

BAVARIAN NATIONAL ASSOCIATION OF NORTH AMERICA.—758 Broadway, Buffalo, N. Y.

CENTRO HISPANO-AMERICANO. — 353 W. 17th St., New York, N. Y.

CENTRO VASCO AMERICANO SOCIETY.—48½ Cherry St., New York, N. Y.

ENGLISH-SPEAKING UNION OF THE UNITED STATES.—19 W. 44th St., New York, N. Y.

FEDERATION DE L'ALLIANCE FRANÇAISE AUX ETATS UNIS ET AU CANADA.—32 Nassau St., New York, N. Y.

FEDERATION OF HUNGARIAN JEWS IN AMERICA.—799 Broadway, New York, N. Y.

FEDERATION OF POLISH HEBREWS OF AMERICA.—32 Union Square, New York, N. Y.

FEDERATION OF RUSSIAN POLISH HEBREWS OF AMERICA.—1824 Lexington Ave., New York, N. Y.

FOREIGN LANGUAGE PUBLISHERS' ASSOCIATION OF THE UNITED STATES, INC.—110 E. 42nd St., New York, N. Y.

FRANCE-AMERICA SOCIETY, INC.—270 Madison Ave., New York, N. Y.

GENERAL NETHERLANDS ASSOCIATION GROUP OF NORTH AMERICA.—179 S. Trenchard St., Yonkers, N. Y.

HEBREW SHELTERING AND IMMIGRANT AID SOCIETY OF AMERICA.—425 Lafayette St., New York, N. Y.

HOLLAND SOCIETY OF NEW YORK.—90 West St., New York, N. Y.

HUGUENOT SOCIETY OF AMERICA.—2 W. 45th St., New York, N. Y.

HUNGARIAN SOCIETY OF NEW YORK.—37 E. 28th St., New York, N. Y.

INDIAN RIGHTS ASSOCIATION.—995 Drexel Bldg., Philadelphia, Pa.

INTERNATIONAL SERBIAN EDUCATION COMMITTEE.—1049 Park Ave., New York, N. Y.

JAPANESE ASSOCIATION, INC.—1775 Broadway, New York, N. Y.

JEWISH CONGRESS COMMITTEE.—8 W. 40th St., New York, N. Y.

JEWISH NATIONAL WORKERS' ALLIANCE OF AMERICA.—189 Second Ave., New York, N. Y.

LAKE MOHONK INDIAN CONFERENCE.—Smiley, Mohonk Lake, N. Y.

LITHUANIAN ALLIANCE OF AMERICA.—307 W. 30th St., New York, N. Y.

LOYAL SERB SOCIETY SRBADIYA.—443 W. 22nd St., New York, N. Y.

MEXICAN SOCIETY OF NEW YORK.—16 E. 23rd St., New York, N. Y.

NATIONAL ASSOCIATION FOR ADVANCEMENT OF COLORED PEOPLE.—69 Fifth Ave., New York, N. Y.

NATIONAL FEDERATION OF UKRAINIAN JEWS OF AMERICA, INC.—505 E. 82nd St., New York, N. Y.

NETHERLAND AMERICAN FOUNDATION.—551 Fifth Ave., New York, N. Y.

ORDINE FIELI D'ITALIA IN AMERICA.—231 E. 14th St., New York, N. Y.

POLISH FEDERATION OF NEW YORK CITY, INC.—705 Courtlandt Ave., New York, N. Y.

POLISH NATIONAL ALLIANCE.—180 Second Ave., New York, N. Y.

RUSSIAN NATIONAL SOCIETY.—5 Columbus Circle, New York, N. Y.

SONS OF ITALY.—231 E. 14th St., New York, N. Y.

THESSALIAN SOCIETY.—667 Eighth Ave., New York, N. Y.

UKRAINIAN NATIONAL COMMITTEE OF THE UNITED STATES.—30 E. 7th St., New York, N. Y.

UNITED ROUMANIAN JEWS OF AMERICA, INC.—799 Broadway, New York, N. Y.

UNIVERSAL NEGRO IMPROVEMENT ASSOCIATION AND AFRICAN COMMISSION LEAGUE.—56 W. 135th St., New York, N. Y.

NATIONAL YOUNG JUDEA.—114 Fifth Ave., New York, N. Y.

YOUNG MEN'S HEBREW ASSOCIATION.—92nd St. and Lexington Ave., New York, N. Y.

ZIONIST ORGANIZATION OF AMERICA.—114 Fifth Avenue, New York, N. Y.

DIVISION XV

SOCIAL PROBLEMS AND CONDITIONS

CRIME CONDITIONS IN THE UNITED STATES

By Bennet Mead

Expert in Social Statistics, U. S. Census Bureau

THE GENERAL SITUATION

There is no evidence of material improvement in the general crime situation. Neither is there evidence that conditions have grown appreciably worse during recent years. There is considerable evidence that many types of crime have long been far more prevalent in the United States than in Canada, England, and other important countries. But owing to the unsatisfactory status of our criminal statistics, we still cannot determine how much crime we have, nor measure the changes from year to year in the total amount of crime, nor in the frequency with which most particular offenses are committed.

CENSUS OF PRISONERS

At the present time, the Federal census statistics of prisoners are the only comprehensive criminal statistics covering the entire country. These statistics represent the number of offenders who are punished by imprisonment, and thus show some of the results accomplished by the courts and the police in the effort to combat crime. In 1926, the Census Bureau began the annual collection of statistics covering the state and Federal prisons and reformatories. The significance of these figures lies in the fact that they cover the major offenders—those convicted of felonies or serious offenses. The prisons and reformatories had about 49,000 prisoners newly received from the courts during the year 1926. These prisoners in 1926 numbered 418 per million of general population. This was a decided increase over the rates of 346 prisoners per million population in 1923, and 323 prisoners per million in 1910. A large part of this increase was due to the rapid growth in the number of commitments to the Federal prisons, which in 1926 received 43 prisoners per million population, as compared with rates of 33 per million for 1923, and 11 per million in 1910.

HOMICIDE

Death Estimates.—There were approximately 10,000 homicides during the year 1927 in the entire country. This estimate covers homicides which were officially registered, and is based upon the census mortality statistics, which showed 9,470 homicides in the death registration area in 1927. This area covered 93.3 per cent of the country's total population, and had 87 homicides in 1927 per million of population. These figures cover both criminal homicides and those classed as "justifiable"—such as cases of self-defense, and the killing of criminals by officers in discharge of their duty. The homicide rate in the United States is far higher than the rates in foreign countries. For example, Canada had, in 1924, only 15 homicides per million population, as against the rate of 85 per million population for the United States in 1924. In order to compare accurately the death rates by homicide from year to year, it is essential that these rates apply to the same area throughout the period studied.

In the 21 states which belonged to the registration area in 1910 the annual homicide death rate per million of population, during the period from 1910 to 1927 inclusive, was as follows:

HOMICIDES PER MILLION POPULATION [a]

Year	Rate	Year	Rate	Year	Rate
1910.....	46	1916.....	54	1922.....	54
1911.....	49	1917.....	60	1923.....	55
1912.....	49	1918.....	51	1924.....	57
1913.....	53	1919.....	52	1925.....	56
1914.....	55	1920.....	49	1926.....	55
1915.....	51	1921.....	58	1927.....	55

Homicide Trends.—These figures show an upward trend of the homicide rate from 1910 to 1917, with a higher rate in 1917 than in any other year of the period. The homicide rate was at a somewhat lower level during the next three years, rose sharply in 1921, and since 1921 has varied between 54 and 57 per million population, with a slight but definite downward trend since 1924. These official statistics indicate that homicides have been somewhat more frequent during the post war period, beginning with 1921, than in the period before and during the war. There has, however, been no continuous upward trend in the homicide rate, and the maximum rate, in 1921, of 60 homicides per million population, has not been equaled since that time.

Homicide Causes.—The mortality statistics show that firearms were the death dealing agency in 1927 in 6,310 cases, or 66.6 per cent of the total number of homicides. In 1926, 6,377 homicides, or 69.2 per cent of the total, were attributed to firearms. These figures demonstrate that a large share of our murders could be prevented by the general adoption and rigid enforcement of drastic measures against "gun-toting." Another very important factor in producing our high homicide rate is our large negro population. In 1927, the homicide death rate in the registration area was 438 per million for the colored population as against 53 per million for the white population. Thus, the colored population had, in proportion to its numbers, more than eight times as many homicide deaths as the white population.

It is to be noted that the homicide rates for the 21 registration states of 1910, as given above, have been considerably lower during recent years than the rates for the entire registration area, to which many states have been added from time to time. In 1927, for example, the entire registration area had a homicide rate of 87 per million population, as compared with the rate of 55 for the registration states of 1910. These differences are explained by the fact that a number of the states which were added to the registration area between 1910 and 1927 have a large colored population; and largely because of this condition, have decidedly higher homicide rates than the 1910 registration states.

Homicide Convictions.—The census statistics of prisoners received into state and Federal prisons and reformatories show, for the year 1926, 45 male prisoners convicted of homicide per million male population. This represents a considerable decrease from the corresponding rates of 57 for 1923, and 54 for 1910. This decrease may, however, be more apparent than actual. All of the states were covered by figures for 1923 and 1910; while several states which were not reported for 1926 had relatively large percentages of prisoners convicted of homicide in 1923.

CRIMES AGAINST PROPERTY

Robbery.—Among the male prisoners received into prisons and reformatories, those convicted of robbery numbered 68 per million of the male population in 1926, as against 51 per million in 1923, and 26 per million in 1910. This increase is consistent with other facts indicating a marked increase in the number of robberies occurring throughout the country. Pay-roll robberies have been so numerous during recent years, that many employers are substituting checks for cash in paying their employees. Also, in a number of states in the Middle West and the South-

[a] Based on figures for registration states of 1910, in annual mortality statistics of the U. S. Census Bureau.

west, vigilante organizations have been developed as defenses against bank robberies. Bank robberies have been greatly reduced where vigilantes have been effectively organized. The automobile is instrumental in many robberies, and up to the present time has been a greater aid to the criminal than to the police. Two other classes of robbery, which have also been numerous since the World War, are mail robberies and jewel robberies. It was this striking increase in the number of robberies which largely formed the basis for the "crime wave" talk which was so prevalent several years ago.

Burglary.—Male prisoners convicted of burglary, who were received into prisons and reformatories during the year 1926, numbered 134 per million of male population, as compared with the rates of 111 per million in 1923, and 127 per million in 1910.

Forgery.—The male prisoners convicted of forgery, per million of male population, numbered 50 in 1926, as against 45 in 1923 and 34 in 1910.

Larceny.—Embezzlement, fraud, having stolen property, and larceny accounted in 1926 for a total of 215 male prisoners convicted per million of male population. This represents a decided increase from the rates for this group of offenses of 148 per million in 1923, and 163 per million in 1910. For larceny, the rate decreased from 1910 to 1923, then increased for 1926. For male prisoners convicted of having stolen property, the rate increased from 1910 to 1923, but showed no further increase in 1926. For fraud, the rate was the same in 1923 as in 1910, but was higher in 1926. All four offenses of this group showed higher rates of male prisoners to population in 1926 than in 1910.

MISCELLANEOUS OFFENSES

Drug Law Violations.—The number of male prisoners received for violating drug laws decreased from 35 per million of male population in 1923 to 33 per million in 1926.

Liquor Law Violations.—The prisoners received in 1926, convicted of violating liquor laws, numbered 61 per million of male population, as against rates of 45 per million in 1923, and 6 per million in 1910.

Carrying Weapons.—The male prisoners received, convicted of carrying weapons, numbered 7 per million of population in 1926, as against 4 per million in 1923 and 3 per million in 1910. The increase for this offense is no doubt due to the effect of more drastic laws against "gun-toting," such as the Sullivan law in New York. At the same time, the number of convictions is still strikingly small in comparison with the number of violations when it is considered that pistols are employed in two-thirds of the homicides, and probably in a larger percentage of the robberies which occur annually.

CRIMINAL STATISTICS

Need for Better Standards.—An adequate system of criminal statistics should provide for the accurate recording and annual tabulation of all offenses known to the police and other law officers, and for the compilation of annual statistics of arrests, trials, convictions, and persons punished by fine, or placed on probation by the courts, as well as for statistics of prisoners. In Canada, Great Britain and in Europe generally, accurate and well organized nation-wide statistics are compiled and published annually by the national governments, covering all or most of the facts just outlined. With such statistics, it is possible to know somewhat definitely what the crime situation is, and to measure the work done by law enforcement agencies in dealing with crime.

Inadequate Statistics.—In this country, a forward step has been taken toward the development of adequate criminal statistics, in the inauguration of the annual census of prisoners by the Federal government, which formerly took such a census only at intervals of ten years. As yet, however, the annual census of prisoners is incomplete, since it does not cover the jails and workhouses, used for the large number of prisoners convicted of petty offenses. Furthermore, our national statistics fail to cover the operations of the police, the

courts, parole and probation agencies, and the essential information concerning the number of crimes committed. For most of the states, also, no adequate criminal statistics are compiled.

New York Law.—During the year 1928, an important forward step was taken by the State of New York when a new law was enacted placing the collection of criminal statistics under the State Department of Correction, which now has ample authority to collect all of the essential facts for an adequate state system of criminal statistics.

National Crime Commission.—During 1928, the National Crime Commission has formed an advisory committee on criminal records, statistics, and Research, which promises to be of distinct value for focusing attention on the needs, and coördinating efforts to develop better statistics.

Standard Crime Classification.—A serious obstacle to the development of better criminal statistics in the United States is the lack of uniformity in the classification of offenses in various states. The International Association of Chiefs of Police has begun, in 1928, a study of the state criminal codes, with a view to standardizing the classifying of offenses by police officials. The Census classification is being used as the standard grouping for this study, which is being conducted through a special research committee of the I. A. C. P., known as the Committee on Uniform Crime Records.

PENAL CONDITIONS AND PRISON LABOR

By Austin H. MacCormick

Assistant to the President, Bennington College

YEAR'S RÉSUMÉ

The year 1928 has seen little of note in the prison world, with the exception of the virtual completion of the new plant at Sing Sing and the new Cook County Jail in Chicago, the opening of the Federal Reformatory for Women at Alderson, W. Va., and the progress of the Hawes-Cooper Bill in Congress toward practically certain passage. The passage of this bill will undoubtedly mark the beginning of a new and stormy era in prison labor. The year has been marked by less riots, strikes, violent escapes and similar disturbances than 1927. There have been, however, several fires in penal institutions, attended by a shocking loss of life. There are today, if one includes the numerous farm and road-camp bunk-houses throughout the country, hundreds of fire-traps into which prisoners are locked at night with small chance of escape in case of fire. Other sections of many prisons, where fire-proof construction is the rule for most of the buildings, still present a serious fire hazard. Several states have taken every possible step, by fire-proof construction and the installation of sprinkler systems, to remove this hazard.

STATE PRISONS

Defects.—The outstanding characteristics of American prisons are now, as they have been for many years, over-crowding and unemployment. A more general characteristic is their lack of programs aimed definitely and scientifically at rehabilitation, however fully in theory they may recognize it as their function.

Unemployment in prisons has increased during 1928, as during the last several years, because of the growth of prison populations without commensurate industrial development. Maintenance details in practically every prison are over-padded and several prisons frankly carry hundreds of men on their rolls as unemployed. Others attempt to conceal the idleness by assigning work which in reality exists only on paper. Employment on new construction has relieved the situation somewhat in a

number of states. Excellent construction work has been done by inmates and it has been demonstrated that inmate labor can be used effectively and economically on prison buildings. The use of prisoners on road work has not been extended greatly, except in the South. New Jersey, Michigan and California, among others, are demonstrating that road work offers a partial solution of the unemployment problem. While most prisons operate farms, the development of farm work, again except in the South, has not kept pace with population growth.

Hawes-Cooper Bill.—The fight against the manufacture of prison products for sale in the open market has been conducted with renewed vigor during the year. The Hawes-Cooper Bill, a permissive act enabling any state to bar the shipment of prison-made goods into the state, has passed the House and is considered assured of passage by the Senate during the short session of Congress. Prison authorities have opposed it as a measure almost certain to have one result,—the increase of unemployment and idleness in prisons.

Prison Industry and Open Markets.—Organized labor and industry are opposed to manufacture for the open market; more specifically, to contract labor shops in prisons and most specifically to the garment industry under prison contracts. Nearly half the states have contract shops in their prisons. Adherents of the State-Use plan offer it as the remedy, although no state operating under this plan has been able to establish a successful industrial program or to free itself from the opposition of organized labor and industry. This is true of such powerful states as New York, New Jersey, Pennsylvania and Ohio. Legislatures are at present slow to authorize necessary expansion of prison industries under any plan and are likely to pass the restrictive measures which are being prepared for submission to them if the Hawes-Cooper Bill is passed.

Situation in the South.—There is little unemployment in Southern prisons. A large proportion of the prisoners are employed on the roads or on farms in most of the southern states, although the central prisons are industrial prisons of the usual type found in the North. Louisiana operates a large sugar plantation and Mississippi a large cotton plantation. Florida has a combination of farm and industrial prison. Alabama and Oklahoma have large industrial prisons. Texas has an extensive system of farms scattered over a large area. The last traces of the lease system in the country disappeared when Alabama abandoned it on June 30, 1928.

OVER-CROWDING IN PRISONS

Cell Capacity.—Practically every prison in the country is overcrowded, several to double capacity. In the majority, inmates are doubled in cells. Some prisons avoid this undesirable practice by the use of makeshift dormitories, while several are compelled to do both. Prison populations have increased steadily in recent years; in many states largely because of the addition of state liquor laws to the statute books and the increased penalties imposed for automobile thefts. Building programs have not kept pace with either abnormal or normal increases in prison populations; they are, in fact, ten years behind the needs of most states. Across the country, new-cell houses are being built or old ones enlarged, but the year has seen no substantial reduction of the over-crowding.

State Projects.—Pennsylvania is slowly completing its prison at Rockview, and a part of the 35 foot wall, designed to enclose 65 acres, has been built at the new Eastern Penitentiary at Gratersford. Michigan has completed several cell-houses of the huge new prison at Jackson and is going steadily forward. Ohio is attempting to stretch the capacity of its old prison at Columbus by building new cell-houses in the cramped enclosure, and is completing the large Farm Prison at London. California has completed one new cell-house at San Quentin and is completing another. New York has practically completed the new Sing Sing on the heights above the old, and expects to occupy

all the buildings early in 1929. Florida, whose prison population doubled in two years, has built at Raiford a large concrete cell-house and administration building which, with its new shops, almost completely transforms this prison. Other states are making feverish and belated attempts to correct the evils of over-crowding.

ADMINISTRATION

The present trend is toward centralization. The State Board of Control type of administration, as found in Minnesota, Wisconsin and Iowa, among others, has met with greater success than any other. Centralization in a single commissioner or director, as found in New York, Ohio and Illinois, for example, has been less successful than was expected. There have been few changes in wardenships during the year, although recent elections are expected to cause several changes in 1929. In Oregon, where there have been a dozen wardens in the last decade, the office of superintendent has been created to provide a resident official above the warden in authority.

DISCIPLINE

There have been no pronounced changes in disciplinary methods. There are few prisons in the country where the discipline may be said to be constructive and character-forming. The chief progress made in recent years has been in the abolition or curtailment of destructive methods. The general tendency is toward decreased rigidity of routine and decreased severity of punishment. Wisconsin has lessened the rigor of its rules to a notable extent. Idaho, on the other hand, has become increasingly rigorous and has constructed a large number of punishment cells of a medieval type.

Solitary confinement on a diet of bread and water is the most severe punishment inflicted today in Northern prisons. In the South, the strap is still used in most of the states. Florida and Georgia have abolished its use, but have substituted the old colonial stocks. In North Carolina, the governor has forbidden the use of the strap, and in Tennessee and Virginia its use must be approved by the superior penal authority of the state. In several of the Southern states, prisoner trusties are extensively used as guards. In spite of theoretical objections to the practice, it works well, the trusties rendering intelligent and faithful service. Abuses do not appear to occur now under the system, although they undoubtedly did when it was first established.

EDUCATION

Efforts to give some education are being promoted more than in the past, because of the number of idle men. Educational work is still on a very low level, however, especially in the field of vocational education. Only nine prisons in New York, Pennsylvania, Illinois and California have full time educational directors without other duties. The best educational program is at San Quentin, where the year has seen continued progress in the development of the intra-mural school and the use of University of California extension courses. Wisconsin makes effective use of University courses, the work being in charge of a field agent of the extension division. Ohio has developed the use of standard correspondence courses further than any other prison. Minnesota has the best prison library in the country, but Wisconsin has developed the best correlation of the state and prison libraries. Several states are making good use of local teachers and of the facilities of state educational institutions. There is virtually no educational work in prisons south of Virginia.

MEDICAL SERVICE

The medical service of most prisons is improving steadily, although few are able to employ high grade full time resident physicians. Little progress is being made in the use of psychology and psychiatry. Massachusetts, New York, New Jersey, Pennsylvania, Illinois and Michigan make definite provision for their use, but use of the findings in administrative problems such as discipline, work as-

signment, etc., has made slight advance. With the opening of the new buildings at Sing Sing, the psychiatric clinic there will be relieved of a handicap which has affected its work this year. It is, however, understaffed.

FEDERAL INSTITUTIONS

Over-crowding and Unemployment.—Progress has been made during 1928, although the Federal prisons suffer as badly as any state prison from both over-crowding and unemployment. At Atlanta, there has been no significant change during the year and conditions are becoming worse as the population increases. Large numbers of prisoners are quartered in unsatisfactory dormitories. At Leavenworth, similar conditions exist and the space available for new buildings within the walls is practically exhausted. The new shoe factory there employs 500 to 1,000 men, although it has not been able to meet the rigid requirements of the army and navy and finds its market in other Federal institutions. At McNeill Island, a new cell-house has been completed and another is under construction. An interesting development has been started in the clearing of a large tract of woodland and its conversion into farms.

Construction.—At the Reformatory for Men at Chillicothe, Ohio, the brick plant has been started and plans for buildings have been drawn, but work on them has not begun. The new Reformatory for Women at Alderson, W. Va., was formally opened on Nov. 24, 1928. This splendid institution, constructed at a cost of $2,500,000, is designed for a population of 500 women and now has about 200. Its staff is of unusually high quality, and the plant is one in which the government can take unqualified pride.

Legislative Aid.—The Porter Bill, now before Congress, provides for the establishment of a Federal farm for drug addicts. The project is endorsed universally as being scientifically sound and the logical relief for the over-crowding in existing institutions. A Congressional Committee, appointed in May to investigate the care and treatment of Federal prisoners throughout the country, has been active since August. The government still keeps unconvicted and convicted prisoners in over 900 jails throughout the country, most of which are far below the standard set by modern penal practice and those of common humanity and decency. The government, moreover, as pointed out by a committee of the American Prison Association, pays a variety of charges, ranging from 20 cents to $3.00 a day and bearing no fixed relation to the actual cost of maintenance.

REFORMATORIES AND JAILS

For Men.—In seventeen states there are reformatories for men, the usual age limit being from 16 to 30. In a few states, they are little more than junior prisons, but the general practice is to stress education rather than productive industry and to employ disciplinary methods suited to the less hardened offender. Indiana has the best physical plant, at Pendleton. Massachusetts, Connecticut, Kansas and Iowa are making progress in correlating education and productive industries. New Jersey supplies the best academic instruction and Pennsylvania the best correlation of academic and vocational instruction.

For Women.—In twelve states, there are reformatories for women, which have programs even more definitely aimed at preparation for life after release than similar institutions for men. The reformatories in Massachusetts and Pennsylvania are worthy of especial note, and those of New York, New Jersey, Wisconsin and Iowa are also doing noteworthy work.

Jail Conditions.—The jails continue to be the Bad Lands of the American penal world. They are characterized, with few exceptions, by failure to provide proper sanitation, employment and exercise, segregation and care of the physically and mentally sick, safeguarding of the rights of unconvicted prisoners, and other things demanded by reasonable standards. The most significant event of the year in the jail field is the com-

pletion of the new Cook County Jail, which will soon be opened. Constructed at a cost of $3,500,000, this jail will provide modern quarters for 1,500 prisoners in single cells, with adequate exercise space. It is planned to establish medical and psychiatric clinics here and to provide both work and instruction, as far as possible.

ORGANIZATION WORK

The New York Prison Association has been attempting, during the year, to promote the appointment of the parole personnel provided for by the new parole laws of 1927 and not yet appointed. The Association has given up the parole supervision work which it has carried on for years and has urged other organizations to do so. It has been using its influence to establish the Psychiatric Clinic at Sing Sing and a separate psychiatric service for the Court of General Sessions, and to secure appropriations for a new city prison on Riker's Island.

Pennsylvania and Massachusetts.—The Pennsylvania Committee on Penal Affairs has continued through the year its series of studies of Pennsylvania's problems which have more than local significance. In Massachusetts, the State Department of Correction, in coöperation with the State Department of Education, is carrying on a series of lectures designed primarily for penal officials.

The American Prison Association has been attempting to secure the passage of Congressional appropriations for an annual census of commitments and prisoners. At its annual meeting held in October, in Kansas City, the Association elected Superintendent George C. Erskine of the Connecticut Reformatory for Men, president. E. R. Cass, the retiring president, was elected secretary.

Other Activities.—The National Crime Commission has held no conference during the year but plans one for early in 1929. The National Committee on Prisons and Prison Labor has continued its advocacy of the State-Use plan of prison industry. The National Society of Penal Information has completed a survey of all the prisons and reformatories for adults in the country and will publish its third *Handbook of American Prisons* early in 1929. It has also made nation-wide studies of medical service and educational work in penal institutions and a study of Southern road camps. Reports of these studies will be published.

PREVENTIVE WORK IN DELINQUENCY

By Douglas P. Falconer

Executive Secretary, Children's Aid Society, Buffalo

MENTAL ABNORMALITY AND CRIME

Remus Case.—The general disgust felt by the public over the farcical trial of George Remus in Cincinnati presented a fine opportunity to the National Crime Commission's Sub-Committee on Medical Aspects of Crime. The report received good publicity, and many legislatures this winter will be asked to supply a remedy.

Crime Commission's Recommendations.—With the approval of Newton D. Baker, chairman of the National Crime Commission, the sub-committee recommends: (1) the question of responsibility should be disposed of before trial; (2) the determination of mental condition should not be made by a jury admittedly unable to pass on the question from their own knowledge; (3) the employment of psychiatrists by both sides should be discontinued. Some official examination by disinterested qualified experts in the study of mental diseases should be provided, the findings to be available to the prosecution and defense alike; (4) if the defendant is suffering from mental disease, the prisoner should be committed to a proper institution for treatment and the expense of a trial avoided.

This is substantially the procedure

in Massachusetts under the Briggs law passed in 1921. The defense is unlikely to try to upset the official report and according to Dr. L. Vernon Briggs, sponsor of the legislation, there has been since 1921 an average of less than one case a year in which alienists have been employed by the defense in trials. Colorado has a somewhat similar provision in that whenever a defense of insanity is set up, the defendant must be committed to a State Hospital for a period of observation, thus assuring an impartial report on the mental condition of the accused.

Recommendations of Psychiatric Association.—The committee on Medical Aspects of Crime also quotes with approval the following recommendations of the American Psychiatric Association: (1) that the disposition of *all misdemeanants* and *felons* be based upon study of the individual offender by properly qualified and impartial experts coöperating with the courts; (2) that such experts be appointed by the courts and paid from public funds; (3) that prisoners be discharged or released upon parole only after complete and competent psychiatric examination with findings favorable to successful rehabilitation; (4) that the incurably inadequate, incompetent and antisocial offenders be interned permanently without regard to the offense committed.

PSYCHIATRIC SERVICE IN COURTS

National Survey.—Winfred Overholser, M.D., Director, Division for the Examination of Prisoners, Massachusetts Department of Mental Diseases, Boston, reported in May to the National Conference of Social Work in Memphis that one hundred and ten courts located in thirty-one states now have full time or part time psychiatrists. Seventy courts in twenty-seven states and the District of Columbia have full time or part time psychologists. A similar development has occurred in institutions for the care of delinquents. He concludes this national survey with an optimistic note in that judges, legislators, prison officials and the public at large are increasingly aware of the important relationship between abnormality and anti-social behavior.

Law Reviews.—That there is a long road still to be traveled is indicated by a study of the leading American law reviews for the decade ending January 1, 1928. In this period there was only one article dealing with the implications of behaviorism for the law. This one was written by a professor from the University of Cape Town, South Africa. This year several articles have appeared in the Columbia and Yale law reviews on the newer psychology and the laws of evidence. Our knowledge is still divided into nearly air-tight compartments.

REPORT OF NATIONAL CRIME COMMISSION

Arrests and Convictions.—The inadequacy of our police systems is forcibly portrayed in a report issued in February by the National Crime Commission which shows that few alleged criminals are caught in comparison with the number of crimes. Of those arrested still fewer are tried, convicted and sent to correctional institutions. For example, in 1925 five per cent of the burglars in Kansas City, Missouri, three per cent of the robbers in Buffalo, and eight per cent of the forgers of St. Louis were arrested. For crimes known to the police in 1924, eleven per cent of the burglars of Baltimore, four per cent of the St. Louis robbers, and ten per cent of various classifications of Cleveland felons were convicted. These figures are taken at random from this startling report gathered from official sources.

Ex-Governor Frank O. Lowden, Chairman of the sub-committee issuing the report, speaking of our rural constables ironically, quotes Shakespeare in *Much Ado about Nothing* as follows:

> "Dogberry—'This is your charge. You shall comprehend all vagrom men. You are to bid any man stand in the prince's name.'
> "Second Watch—'How if he will not stand?'
> "Dogberry—'Why then, take no note of him but let him go and presently call the Watch together and thank God you are rid of a knave.'"

Scope of Report.—The report should be studied by all interested in the apprehension and conviction of criminals. It deals with police organization, criminal identification, abuses of the power of the prosecuting attorney, the bail system, indictments, trial by jury of petty offenders, and concludes with this forceful language, "The decentralized, uncontrolled court system, the poor character of the minor judiciary, the lax administration of the bail system, the needless reliance on grand juries and petit juries, the irresponsible work of the prosecuting attorneys and the impossibility of finding out through statistics what is being done or should be done, all indicate a pre-scientific stage of evolution, a time when man did not believe that it was possible consciously by taking thought to improve the social machinery which had come down to him from his ancestors. Science has as yet gained little foothold in the work of protecting society from crime."

CONFLICT OF OPINION ON PREVENTION

Dr. Schlapp.—While this demoralized condition of criminal law administration is being studied, the opinions of experts on the causes and treatment of crime differ widely and the confused public knows not whom to follow. For instance: Max G. Schlapp, M.D., and Edward H. Smith have just issued a book, *The New Criminology: A Consideration of the Chemical Causation of Abnormal Behavior.* Dr. Schlapp, an eminent neurologist, has for years been achieving real progress in neuropathology in the New York Post Graduate Medical School. He also served with the New York Children's Court clinic and from this excellent background, he concludes that criminal acts are the result of chemical reactions and improper glandular functioning and that the individual has no control over his behavior.

Judge Kavanagh.—Marcus Kavanagh, on the other hand, for thirty years judge of the Superior Court of Cook County, Illinois (Chicago), has dealt with large numbers of all kinds of criminals. He concludes the criminal is such because of a free will choice and should be held strictly accountable for his acts. This position is developed at length in his recently published volume, *The Criminal and his Allies.*

REMEDIAL THEORIES

H. E. Barnes.—Of different significance is Harry Elmer Barnes' *The Evolution of Penology in Pennsylvania.* Here is a book reviewing the evolution of America's theories of penology and gives an excellent opportunity for us to see where we are and why. He shows the trend toward a scientific approach, but the approach is halting and slow and the achievements of today pitifully meager.

Prof. Karl N. Llewellyn of Columbia Law School in a paper read at the National Conference of Social Work on "Law Observance versus Law Enforcement," stressed the fact that law observance is simply a more or less instinctive or automatic observance of *mores* or folk ways of the major groups of society. These have been enacted into law. Laws which conflict with these social patterns create the problem of law enforcement and the answer, therefore, is not more enforcement but a "process of microscopic study of the specific subgroups in our society." Only by such study can adjustments be made, he holds, and bigger and better police departments cannot produce law obedience.

Dr. Fritz Wittels of Vienna, a pupil of Freud, is now in this country to pursue his study of criminals in which he has been engaged since 1904. He summarizes his belief as follows: "Our present methods of proceeding against the criminal are not satisfactory. We do not protect society properly. There is no relation between crime and punishment. We still follow the old method of retaliation, 'an eye for an eye and a tooth for a tooth.' We use the criminal as a safety valve for our own sadism. We cannot torture our neighbors as in medieval times, so we glory in the death of criminals. To

protect society is intelligent, but jails will not protect society." He believes psychoanalysis would do much to straighten out the tangles in the life of the criminal, especially if applied during childhood when the behavior difficulties are just starting.

Judge Appell.—The lack of intelligent treatment of the young delinquent is stressed by many. Judge George C. Appell, President of the New York State Association of Children's Court Judges, is Judge of the Westchester County Children's Court. He "rides the circuit" around the county each week. In the *North American Review* for November, 1928, he complains of our failure to use the knowledge we have to aid children and points out our particular neglect of the rural sections, quoting the Federal Children's Bureau report that of fifteen thousand communities of twenty-five thousand population or more, only one hundred forty-seven have the benefit of a modern Children's Court.

Progress.—In spite of the pre-occupation of the general public with the national election some progress in the prevention of delinquency has been made this year. The able work of the National Crime Commission is slowly focusing attention on some of the greatest defects in our administration of the criminal law.

Conclusion.—So experts differ as to the facts and the solution. This clash of opinion, though, is infinitely preferable to indifference. We clearly know too little of the nature, causes, and extent of crime. From the present conflict, progress will come largely in so far as the scientific approach dominates our legislation and administration.

ORGANIZED SOCIAL WORK

By Howard R. Knight

General Secretary, National Conference of Social Work

INTERNATIONAL ORGANIZATION

General.—Social work is now generally regarded as an integral part of community life, with a definite place in modern civilization. Its progress is slow; at times, painfully slow. No spectacular advances are made, for social work is subject to the same slow growth and development as any other fundamental phase of community life.

Paris Conference.—However, the year 1928 has seen several significant events and the emergence of certain important trends. For the first time an International Conference of Social Work was held in Paris in July. Participation of the United States in this significant event was wholehearted and extensive. Not only was a generous share of the necessary financial support raised in the United States, but a delegation of approximately one hundred leaders of social work in the United States attended the International Conference and participated to a large extent in its discussions.

Groups Represented.—The International Conference was one of four conferences brought together by the genius of Dr. René Sand the Technical Counselor of the League of Red Cross Societies, in a Social Welfare Fortnight. Three of the four groups, namely, the International Housing and Town Planning Congress, the International Congress of Public and Private Welfare, and the International Child Welfare Congress, with subsidiary groups, represent organizations that have met before in Europe or the United States, but heretofore they had been independent of each other. The International Conference of Social Work was a new grouping which had its inspiration in earlier visits of Dr. Sand to the National Conference of Social Work in the United States. It brought to-

gether leaders from twenty-six countries who were interested in comparing their experiences and exchanging ideas, particularly in fields of social endeavor not covered by the other congresses.

Work of Conference.—The Conference concentrated its attention on, first, general organization of social work; second, training for social work; third, the methods of social case work; fourth, social work and industry; and fifth, social work and public health. The complete proceedings of the Conference will be published later. Social workers from the United States gained a much better understanding of social problems existing in Europe and secured much detailed information concerning the development of the publicly supported welfare work which has been carried further in Europe than in the United States. It was voted by the Conference to hold the Second International Conference in four or five years, probably in Holland.

AMERICAN ORGANIZATION

Conference on Community Welfare.—One of the most significant meetings in the United States was the Conference on Community Welfare, arranged by the Association of Community Chests and Councils at Washington in February. The Conference was particularly significant in that the great majority of attendants were leading business and professional men from the cities maintaining community chests. Only a small proportion were the professional social workers.

Community Chest. — Unquestionably one of the most outstanding developments in social organization in the past decade has been the Community Chest movement. With its growth, various questions of policy and method have arisen which need to be thoroughly explored if both social work and the community chest, as an integral part of social organization, are to develop constructively in the future. This Conference organized itself into eight sections. Reports were carefully prepared for each section prior to the Conference and the sessions were devoted to a discussion of these reports.

TRENDS OF SOCIAL WORK

Division of responsibility for welfare work between municipal government and voluntary organizations received lengthy consideration. There has been a decided shift of support for some forms of social work from private auspices to the public agencies. This is particularly noticeable in the field of public health, where the administration and support is now almost entirely in the hands of public authorities. It has also been pretty generally true in the development of public recreation.

Leaning to Public Agencies.—The trend at the present time is for more and more of the cost of relief to be placed on the tax bill. Some cities have gone much farther along these lines than others, the outstanding example probably being Detroit. While no final conclusions could be reached because of the complex character of the problem, it seemed to be agreed that, where the governmental agencies had proved able to administer certain forms of social work as effectively as private agencies, they should be allowed to take the work over.

Problems of Support.—One of the most puzzling problems that has developed with the growth of the community chest has been the question of the support of national and, to some extent, state-wide welfare organizations, from communities in which there are community chests. The existence of a community chest has frequently made the securing of funds for national social work agencies more difficult. On the other hand, the situation is forcing the national organizations to appraise carefully the service which they render to the local community either directly or indirectly, and to recognize genuine service alone as their basis of support. This, again, is an involved question concerning which no definite conclusions could be made. It was suggested, however, that a joint committee, representing the national organizations of the community chests and the vari-

ous national welfare organization, explore this field farther in order to discover the services actually rendered and also ways of interpreting these services to local communities. To secure from local branches of national business corporations a fair share of the support of local social work has been a serious problem with many chests. Various local and administrative problems are involved here. Further study and discussion of this question were recommended.

LOCAL ORGANIZATION

Service Problem.—Another importnat question discussed at this Conference concerned the local organizations which ought to be included in a community chest. The general conclusion was that all agencies rendering real service to the community should be included unless the work was of such a nature or of so poor quality that it did not justify community support.

Community Trusts.—It was pointed out that there now exist sixty-three community trusts in the United States, which during the year 1927 were responsible for the distribution of $593,000.00. This represents but a small part of the amount that will be distributable in the future as the income from other funds entrusted to the community trusts become available. Considerable discussion was given to technical administration problems of community funds, as to methods of raising the annual fund, educational publicity, and the like.

FINANCIAL PROBLEMS

Cost of Work.—Finally, emphasis was given to the necessity for further fact bases for community welfare programs. Figures produced by a study of the cost of social work in nineteen leading chest cities showed wide divergence as to (a) actual cost of various types of social work; (b) division of responsibility for various forms of social work, and (c) the proportion of the net cost going for various forms of social work, such as health, character building, dependency, and the like. There are also wide variations in institutional capacity provided in various cities, the amount of dependency reported, and the ratio of trained service to the amount of work done. All this indicated the need for further study which was planned.

RESEARCH

Memphis Conference.—This Conference is but one further indication of a trend in social work for a more accurate fact basis. This trend was evident, also, in the meeting of the National Conference of Social Work at Memphis, Tennessee, in May. A larger proportion of its program was devoted to reports on research material than has been given for some years. It is evident that social work leaders throughout the country are seeking more accurate information as to the causes of social problems and are endeavoring, as never before, to test the results of social work methods by accurate measurements so far as possible and to place the plea for adequate financial support more on the basis of needs met than on an emotional appeal.

Increase in Workers.—Such a trend is the obvious result of the steadily increasing proportion of well trained social workers now coming into positions of leadership. Social work is being recognized more and more as a profession comparable with medicine and the law. This trend, of necessity, must be based on an increasing body of facts and knowledge concerning social problems and social work methods.

COORDINATION OF WORK

Group Activities.—Another significant trend that is becoming evident, particularly at the National Conference of Social Work, is the tendency to look at the social program of a community as a whole and to stimulate the process of gearing the activities of particular agencies into a community-wide program. Considerable emphasis was iven at the National Conference of Social Work to joint meetings of various special groups in the field for the discussion of better coöperation and for clearer

understanding of the contributions each group had to make. Much of this tendency is due to the development of councils of social agencies in such cities as have well organized and functioning councils. The community chest movement itself has brought about some of this process of integration, and social agencies themselves are realizing as never before the necessity of coöperative planning for the solution of some of the most pressing problems.

Economic Relief.—Prior to the war, there had been a tendency in the whole welfare field toward social control through legislation. During the war and since, discussion of many of these efforts has lapsed, but they are beginning to come to the front again. Unemployment, provision for old age, the hazards of ill health, and other economic situations which affect the welfare of the individual but which are beyond the control of the individual are being seriously studied and definite proposals are being presented for discussion. This is opportune, for the next four years there will be in national leadership a man familiar with social problems, sincerely and personally interested in finding adequate solutions for them, and experienced in and sympathetic with the various methods of social work.

SOCIAL HYGIENE

By Ray H. Everett

Managing Editor, *Journal of Social Hygiene*

HISTORY AND AIMS

Exposition.—Social hygiene, as it is generally accepted in the United States, has a somewhat different significance than is given it in England and on the Continent. In those countries it deals with a wide group of maladies, and includes much of the work which in this country is done through the field of public health In the United States its connotations are limited to problems dealing with and growing out of sex relations. There are, however, many phases and many problems included under the heading of social hygiene. Marriage, divorce, illegitimacy, prostitution and various forms of sex delinquency as well as venereal disease are problems which arise from sex relationships; and it is these things which tend to sustain or destroy the basic social relationships. In a constructive branch of its field it attempts to reach not only those individuals who are immoral, or with a tendency to become so, but provides for the social protection of every individual, and seeks to provide sex education as a natural, logical part of a broad educational and character-building program.

Early History.—In the earlier stages of the movement in this country there were several organizations having as their general purpose the bettering of social conditions. There were three major lines of work: first, the diagnosis and treatment of the venereal diseases by medical measures; second, the suppression of prostitution by legal measures, and third, the character training of youth through education. The formation of the American Social Hygiene Association grew out of these various organizations, as the desirability of a unified organization with a broad program, was realized. This merging of several of the most important voluntary agencies took place in 1914.

SOCIAL EDUCATION

Scope of Work.—The following outline, necessarily brief, shows the important achievements of the year, and indicates the comprehensiveness of the field of social hygiene. Since education is the basis of any constructive social movement, it has been the aim of the American Social Hygiene Association to promote such character education and training from childhood as shall develop right attitudes,

ideals, standards, and behavior in respect to sex in its broader sense. Educational work is conducted with parents, teachers, religious leaders, social workers, nurses, industrial and professional groups, students and the general public. Trained lecturers have done the major portion of the work of presenting to the public the educational program. The staff of the department delivered 1,464 talks under the auspices of 645 agencies with a total attendance of 227,400 during the year.

In the Higher Institutions.—The study "The Colleges and Sex Education" has been continued, and two reports are now available in print. A large proportion of the 202 institutions which participated in the study are making use of the methods and materials outlined in these reports which deal with sex-social education in the colleges. Further study is being made to secure as full information as possible as to the extent to which colleges are including sex education, and the methods and subject matter employed. The staff of the Association conducted 21 study courses in social hygiene education of ten days to six weeks each, in cooperation with universities, colleges, normal schools, church schools and institutes.

In the High School.—In response to an increasing demand for suitable educational material and tried methods, two outlines which have gone through various stages of experimentation and revision have been published for use in connection with the Junior and Senior High Schools. In coöperation with the United States Public Health Service the Association completed a study of the status of sex education in the high schools of the United States and the data have been published by the Service. It shows an encouraging increase in extent and breadth of sex education since the first study of this kind was made in 1921.

Parent-Teacher Work.—The staff of the Association participated in one national and fifteen state conventions of the Parent-Teacher Associations, and addressed parent-teacher groups in 22 states with a total attendance of 32,000. Other work was developed through correspondence, conferences, special program and literature.

In the Church.—In coöperation with the Federal Council of Churches the Association addressed various church groups, organized a number of study groups of parents and church leaders, and conducted courses in summer schools and conferences. Lecture service was given through the Y. W. C. A., the Y. M. C. A., the Young Men's and Women's Hebrew Associations, boy and girl scouts and many other sources.

In Negro Schools.—Gratifying progress has been made in the inclusion of social hygiene education in the Negro colleges and normal schools. In this field five credit courses in coöperation with four summer schools were given.

LEGAL AND PROTECTIVE MEASURES

Investigations.—The consolidation of the two divisions, the legal and the protective, took place at the beginning of the year. Investigations were made in 24 cities of two states at the request of the State Health Departments. In addition, 21 investigations were made in 11 cities in coöperation with local committees or groups interested in legal and protective measures. Conferences with officials and different social hygiene societies have proved of value. Additional investigations were made in 23 cities in 13 states, thus completing the nation-wide survey started late in 1927, the purpose of which was to secure a picture of prostitution conditions since the publication of Woolston's book, *Prostitution in the United States.*

Conferences were had with individuals or organizations in South Carolina, New York, New Jersey, Louisiana, and Kentucky offering cooperation for needed legislation in those states. Progress has been made on the revision of the Legislation Manual. Citation of laws has been brought to date, and the final draft is in course of preparation.

Special investigations were made in California, Illinois, Louisiana,

Pennsylvania, Rhode Island, Texas, in addition to at least one city in every other state. The information thus obtained was presented, in some cases, to communities concerned; and, where obtained in cities near army posts, to the Surgeon General of the army; where port cities were visited, the information was presented to the U. S. Public Health Service.

Addresses were presented at the Conference of Juvenile Agencies, at the National Probation Association, the meeting of the American Prison Association, and at the Social Hygiene Institute held in Chicago in October.

Trend of protective work at the present time is toward cleaning up and keeping clean the environment; toward stimulating the appropriation of more public funds for the prevention of delinquency rather than the use of these funds for salvaging projects.

MEDICAL ACTIVITIES

Research and Study.—All agencies engaged in the campaign against the venereal diseases have for one of their main objects progressive reduction in the prevalence of these diseases. Prolonging life by early and continuous treatment is equally important to those infected and to the public, but to accomplish this research is essential, and one of the most important functions of the social hygiene forces has been the promotion of further study through research and prevalence studies. In coöperation with the New York Tuberculosis and Health Association a prevalence study of venereal disease was made in the five Boroughs of Greater New York. Five other prevalence studies were also made in various cities and counties throughout the country. Studies were made of the clinic records in one city, a drug store survey was made in another, and present-day charlatanism in the venereal disease field was studied in three cities. An Indian Reservation provided the field for study of the venereal diseases in this population group.

In coöperation with the Tennessee State Board of Health, the United States Public Health Service, the Medical Society of the County of Kings, and the National Society of Penal Information, special studies of venereal disease diagnosis, treatment, case-finding and case-holding have been continued.

Conferences and Lectures.—Many important conferences have been attended, among them being the Third Race Betterment Conference, the Connecticut Social Work Conference, the John A. Andrews Clinical Society at Tuskegee Institute, and annual meetings of the American Medical Association, the Virginia State Medical Society and the Southern Medical Association. Lectures have been given by the staff members of this division, to college groups, nurses, and health officers, and numerous statistical studies have been made.

In March, 1928, a group of public-spirited laymen, acting through Dr. Edward L. Keyes, President of the American Social Hygiene Association, invited a group of syphilologists and investigators interested in syphilis to meet for the purpose of organizing a committee on research in syphilis. It is the purpose of the committee to expend the sums placed at their disposal by a group of donors for subsidizing and developing research in both the clinical and laboratory aspects of the disease.

PUBLIC INFORMATION

In addition to the lecture activities of the Association, several new pamphlets have been revised. The Association's pamphlets, motion pictures, books, posters and exhibits, together with its periodicals, the *Journal of Social Hygiene*, and the *Social Hygiene News* are used both throughout the U. S. and in all parts of the world. With a membership of approximately 10,000 educators, physicians, social workers, lawyers, religious leaders and laymen and women, the A. S. H. A. is proving, constantly, a most potent factor for the advancement of social betterment both nationally and internationally. Of especial value in 1928 were the Regional Conferences in Louisville and Chicago which furnished oppor-

tunities for 2,000 workers in the social hygiene field to discuss their problems and to hear the reports on researches and demonstrations completed or under way.

INTERNATIONAL ACTIVITIES

Traffic in Women and Children.—The increasing value of the international study of the traffic in women and children, carried on under the ægis of the League of Nations, is evidenced by the world-wide tributes it has received. Among the most recent of these was that paid by Lord Cushendun, British delegate, who said on September 18, 1928, at the thirteenth meeting of the Ninth Ordinary Session of the Assembly of the League of Nations:

"There are two points in this Report which I think are of special significance. First of all, we are told that after a careful study by experts of the question relating to the licensed house system, a unanimous opinion has been given against that system. I cannot imagine that, in the face of such a recommendation as that, the governments concerned will not feel that a duty is cast upon them to leave the matter no longer where it rests at present; and the second point of significance is this. In the Report I read that 'The Fifth Committee agrees with the Advisory Committee as to the necessity of adopting stricter measures against *souteneurs* in order to put a stop to their operations, which are among the main causes of the traffic in women.'

"I want to give the strongest possible support to that recommendation on behalf of the British delegation and of the British Government. Whatever excuses some people may find it necessary to make for human frailty which produces vices of a sexual character, no decent man and no decent woman can have any excuse to make, or any tolerance to extend to those who, for the sake of a money consideration for themselves, stimulate the vice of others and try to promote the temptation which leads to those vices—I think that these people referred to in that sentence deserve no mercy, and that every government should carefully consider whether the laws which they administer are sufficiently stringent to prevent these persons, who are a curse to mankind, from carrying on their nefarious operation."

Foreign Coöperation.—During the year, Drs. Harry H. Moore, Edward L. Keyes, John H. Stokes, and Reuben L. Kahn have attended various outstanding medical meetings in Europe to report on work being done in the United States and to bring back reports of the advancement being made in the medical field in Europe.

MENTAL HYGIENE

By George K. Pratt

National Committee for Mental Hygiene

General Developments.—Except for the establishment of a new and potentially powerful organization in this field of mental hygiene and except also for the beginning of active preparations for an International Congress of Mental Hygiene, 1928 witnessed relatively few new developments in mental hygiene. Rather was the past year devoted to the consolidation of gains made in 1927, and to the furtherance of projects initially begun in the preceding twelve months.

AMERICAN FOUNDATION FOR MENTAL HYGIENE

Purpose.—By far the most significant development in 1928 was the creation of a new philanthropic foundation, known as The American Foundation for Mental Hygiene, Inc., establishment of which was announced at the 19th annual meeting of The National Committee for Mental Hygiene, Nov. 8. The Foundation will serve primarily as administrator of gifts and bequests for mental hygiene work in any part of the field.

Endowment Prospects and Gifts.—Unlike most foundations created by persons of wealth interested in specific philanthropies which benefit from endowments immediately available, it comes into existence without an endowment of its own but with the confident expectation of securing the funds necessary to carry out its purposes. The Foundation already has received a gift of $50,000 from the executors of the estate of Mrs. John I. Kane, which will be used in helping to finance the First International Congress on Mental Hygiene. In addition to this gift, a conditional pledge of $100,000 toward the first million dollars of endowment has been secured, and bequests to the value of more than $500,000 have been incorporated in wills definitely known about, naming the Foundation as beneficiary. Although it will be many years before some of these bequests, which are subject to the life-use of given individuals, will become payable to the Foundation, the fact that they have been made before any intensive or systematic effort to secure bequests has been begun seems to indicate that in the course of time the Foundation will have many millions of dollars bequeathed to it by persons interested in mental hygiene work.

Agency to Receive Funds.—One reason why a comparatively small amount of the money available for philanthropic purposes in the past has been diverted to use in the field of mental hygiene undoubtedly is that there has been no permanent agency to which funds can be given with reasonable assurance that they will continue to be used for the original or related purposes through coming generations. Now with the establishment of The American Foundation for Mental Hygiene, there is such an agency, and, provided it has adequate funds at its command, it is certain to be immediately responsive to the needs of the ever-broadening field of mental hygiene. Another advantage is found in the fact that gifts made to The American Foundation for Mental Hygiene will be administered by a Board of Trustees composed largely of persons who have special and expert knowledge of the field and subject of mental hygiene. This, in itself, gives this new Foundation a unique place among existing philanthropic agencies.

Aims.—The new foundation will not in any sense compete with or take the place of The National Committee for Mental Hygiene, or of any other agency or institution in the field. Its chief aim is to seek and secure a large fund for all sorts of work in the field of mental hygiene, at home and abroad, and to administer that fund in the interests of the movement as a whole, so that the present condition of financial instability, which hampers existing organizations engaged in such work, especially The National Committee for Mental Hygiene, may be ended for all time, with incalculable benefit to all agencies involved and to the general public.

Officers.—The officers of The American Foundation for Mental Hygiene include: Honorary President, Dr. William H. Welch; President, Dr. Arthur H. Ruggles; Vice-Presidents, James R. Angell, Rt. Rev. William Lawrence, Dr. William L. Russell; Treasurer, Frederic W. Allen; Secretary, Clifford W. Beers. The members of the Executive Committee include: C. W. Beers, Dr. C. Floyd Haviland, Harry P. Robbins, Dr. Arthur H. Ruggles, Dr. William L. Russell, Dr. George L. Wallace, Dr. William A. White, and Dr. Frankwood E. Williams.

FIRST INTERNATIONAL CONGRESS

Organization.—The closing weeks of 1928 were utilized to complete initial plans and to guarantee the financing of the First International Congress on Mental Hygiene to be held in Washington, D. C., in May, 1930. The purpose of the Congress lies in the need to pool international experience and knowledge in problems of mental hygiene. Clifford W. Beers, Secretary of the National Committee for Mental Hygiene, has been appointed Secretary-General of the Congress. Dr. Arthur H. Ruggles is Chairman on Organization, while Dr. Frankwood E. Williams is Chairman

of the Executive Committee on Program.

The mental hygiene movement has spread rapidly since the World War. Already national committees, leagues, councils or societies for mental hygiene have been established or are being organized in twenty-one countries besides the United States and Canada, and all important countries undoubtedly will be represented by delegates from such agencies by the time the First International Congress is held.

Out of the Congress is expected to come an International Committee, with headquarters in this country, which will act as a clearing house for information on all phases of the subject and as the coordinating mechanism for the development of programs of activity and study in the field of mental hygiene for the benefit of all countries.

Plans and Purposes.—Discussing the plans and purposes of the First International Congress, Dr. Frankwood E. Williams, Medical Director of the (American) National Committee for Mental Hygiene, recently said: "Problems in mental hygiene, or human behavior,—whether they concern our loves and hates, our likes and dislikes, our prejudices or our enthusiasms, our services, or unwillingness to serve, or whether they concern matters of larger social failure in the form of delinquency, dependency, inadequacy, or nervous and mental disease or defect—are not peculiar to any one country. They are common to the life of man everywhere. Men and women, of many professions, in clinic and laboratory throughout the world, are engaged in studying these problems. Their success or failure is a matter of importance.

"Much new knowledge of a fundamental sort and much experience in social procedure has been gained. We need to pool this knowledge; to equalize its distribution, that time and energy may not be expended in repetition of research or repetition of error in social planning; to reach if possible a consensus of opinion on certain fundamental matters; to learn where knowledge is yet too incomplete to make possible such agreement; to search out the next steps in the approach to a clearer understanding of the forces which go to make up 'human nature' and to determine human relationships. This International Congress will contribute much to these ends."

GROWING INTEREST OF STATES IN MENTAL HYGIENE

Virginia.—That mental hygiene is soundly intrenched in a position of importance is indicated by the action taken in recent years by a growing number of state bureaus or departments which have added work in mental hygiene to their routine activities. Virginia is the latest state to join these others. In October, 1928, the Department of Public Welfare organized a mental hygiene clinic staff to deal intelligently with numerous behavior difficulties and personality problems of children in various communities to which the clinic will make regular visits. A psychiatrist, psychologist, and the necessary psychiatric social workers comprise the clinic staff.

New Jersey likewise extended its extramural clinic service in 1928 by establishing a traveling mental hygiene clinic service under the auspices of the Morris Plains State Hospital for Mental Diseases. Already Dr. Philip J. Trentzsch, the Clinic Director, announces that thirteen communities in the district served are visited regularly by the clinic staff.

Other States.—Massachusetts, New York, Pennsylvania, Illinois and a number of other states where clinic service of this kind has been available for several years utilized 1928 to extend and amplify this service.

CLINICAL TRAINING AND FUNCTIONS

Fellowships.—Scarcity of adequately trained personnel to staff child guidance and other types of mental hygiene clinics continued throughout the past year. Although fellowships for training in extramural psychiatry have been made available since 1925 by the National Committee for Mental Hygiene, these fellowships presuppose some background of training and experience in formal

psychiatry on the part of candidates. A number of these fellowships have been awarded to physicians with this requisite experience, but many applications were received from those who had no special training in psychiatry. Accordingly, in order to assist in interesting physicians in the extramural aspect of this specialty, the Commonwealth Fund in 1928 established at the Colorado Psychopathic Hospital in Denver a limited number of two year fellowships for training in the fundamentals of psychiatry and for which applicants do not require previous psychiatric experience. In addition, the Commonwealth Fund has made available two to three year fellowships in psychiatry at the Boston Psychopathic Hospital and at the Henry Phipps Psychiatric Clinic in Baltimore. At these two places applicants are required to have been in the psychiatric field for one to two years previously and to have already demonstrated definite ability and interest in the field.

These fellowships are in addition to those for special training in child guidance work of one year's duration as offered by the National Committee for Mental Hygiene through grants from the Rockefeller Foundation and the Commonwealth Fund respectively. By means of these fellowships, as well as by stimulation of interest in mental hygiene and psychiatry among medical students, it is hoped some of the rapidly growing demand for well-trained psychiatrists may be met.

Psychiatric social work continues to function vigorously as one phase of mental hygiene clinical work. This will always be its most important function. Within the last year a marked tendency has been noted among many social agencies that utilize psychiatric clinics extensively, to employ a social worker as a consultant on the agency staff to sift out the cases that need mental hygiene attention and to aid the agency to follow out clinical advice and recommendations. Psychiatric social workers thus have been added in 1928 in this new capacity to family welfare societies, children's aid associations, settlements, public health nursing organizations, and others.

American Association of Psychiatric Social Workers.—The number of trained psychiatric social workers is greatly increasing. The graduate schools of social work are turning out about sixty workers trained in psychiatric social work per year. The American Association of Psychiatric Social Workers has a total membership of 252. This association is concerned chiefly with the maintenance of standards. Its qualifications for membership are an A.B. degree, graduation from a recognized school of social work, with one or two years' additional experience in a position in psychiatric social work. There is a clause permitting non-graduates to qualify for membership on a basis of four years' adequate accomplishment in a position in psychiatric social work. The Association voted to discontinue this clause after May, 1929, indicative of the strengthening of the organization as a professional group.

HOUSING PROBLEMS

By George Gove

Secretary, New York State Board of Housing

STANDARDS AND PROJECTS

Public interest in housing has passed through two stages: first, recognition of the housing problem, investigation and agitation; second, an attempt to combat the evils of bad housing through restrictive measures, establishment of minimum standards of quality, and space in housing necessary under urban conditions for health, safety and public welfare.

Supply and Cost.—In recent years, public interest has advanced toward a third stage; namely, to make the established legal standards effective

by measures which will supply a sufficient quantity of housing at rates which the average wage earner can pay. Progress toward this end is to be measured by the results of current experiments in reduction of housing costs. Successful experimentation in this field requires large scale operation. In the past year, a number of large scale housing projects have been undertaken for the purpose of demonstrating the economies which may be obtained by the application of new methods of land utilization, of design and of construction.

RADBURN

The most significant of these is at Radburn, a satellite town now under construction on a site of 1,200 acres which a year ago was acreage land on the Erie Railroad about seventeen miles from New York. This is the most comprehensive experimental housing enterprise ever projected in the United States. The site was acquired primarily for applying experience gained in low-cost urban housing projects, especially that of Sunnyside, a development recently completed by the City Housing Company in New York City. Radburn will accommodate ultimately a population of about 25,000 and will represent a value of approximately $60,000,000. It is the first town to be planned and developed with relation to the automobile age and resulting ways of living. It is an initial step toward decentralization, for it will remove from the congested centers of New York both the "works" and the workers. A portion of the site has been laid out for industrial purposes with railroad sidings and other facilities, and already one large industry has moved to the new town.

Freed from limitations imposed by the old urban street system, the new town is planned to provide ample facilities for traffic and to insure safety for pedestrians and children. Major thoroughfares divide it into units accommodating from four hundred to six hundred families in houses grouped about a series of closed-end streets. A complementary system of parkways and garden paths is provided for pedestrians. Children can go to school without crossing the street. There are playgrounds reached by garden paths leading directly from the houses, and neighborhood shopping centers are equally accessible with the same safety. Radburn will demonstrate the major economies in the development of raw land, the construction of public utilities and of housing. The entire project is being developed without speculative profit by a limited dividend corporation.

HOUSING FOR NEGROES

Chicago.—Several large scale experimental housing projects have also been undertaken in the past year in the larger cities of the country. Among the most significant are the two multi-family projects built by the Julius Rosenwald fund and by Marshall Field in Chicago, and the Paul Lawrence Dunbar Apartments constructed by John D. Rockefeller, Jr., in New York City. The projects constructed under the Julius Rosenwald fund and by Marshall Field in Chicago have been designed for negro families. Each project covers a city block and is designed to offer the lowest possible rentals for modern housing accommodations through limitation of dividends and reduction of capital costs and annual maintenance charges.

New York.—The Paul Lawrence Dunbar Apartments erected by John D. Rockefeller, Jr., incorporate for the first time in this country the principle of coöperative ownership designed for negro families. The buildings occupy a square block in Harlem. The apartments have been sold to colored families exclusively on a basis which permits a minimum initial payment and amortization of principal in approximately sixteen years at monthly rentals which are comparable to rentals now charged for the sub-standard dwellings occupied by the colored population.

PROGRESS UNDER NEW YORK HOUSING LAW

Significance.—Especially significant has been the housing progress under the New York State Housing

Law. Projects already constructed under this law clearly show that the savings obtainable under its terms are sufficient to bring adequate housing within the means of a large part of the population for which ordinary commercial enterprise now fails to provide. Moreover, it has shown that any group of wage earning families with regular income, if effectively organized and aided by good business judgment may under the terms of this law provide adequate housing accommodations for themselves without subsidy, philanthropy or financial aid other than that available through the ordinary lending institutions.

Housing for Clothing Workers.—Under the State Housing Law three large scale operations have been completed in the past year and several new projects initialed. Moved by the success of their first operation in the Bronx, the Amalgamated Housing Corporation, sponsored by the Amalgamated Clothing Workers of America, has acquired a new site for a similar housing project adjacent to the present buildings. The new structure will occupy approximately a square block. It will be six stories in height with elevators and all modern conveniences and will be offered to members of the Clothing Workers Union under a coöperative ownership plan, with an initial payment ranging from $250 to $500 per room and a monthly rental charge ranging from $9 to $12 per room per month.

A Jewish Project.—The Farband Housing Corporation, sponsored by the National Jewish Workers Alliance, has completed two structures occupying approximately a square block in the Bronx, which are now occupied by members of the association under a coöperative ownership plan similar to that of the Amalgamated Housing group.

Brooklyn Developments.—In the Borough of Brooklyn, a site has been acquired for a large project sponsored by a committee appointed by the Chamber of Commerce. In this project apartments will be offered either for rental or for coöperative ownership at monthly rates not in excess of the maximum rentals permitted by the State Housing Law.

New Project in Manhattan.—Of the new projects now being planned under the State Housing Law, the largest has been designed to occupy several square blocks on the lower East Side in the Borough of Manhattan, New York City, to accommodate 1400 families and to cost approximately $2,000,000.

GENERAL RESULTS AND SUGGESTIONS

The essential values in the application of new principles and methods to the problem of low cost housing are shown by 1928 developments. Chiefly, they have shown the necessity of eliminating speculative profit, of reducing the heretofore exorbitant costs of financing and of effecting important savings in maintenance. They have demonstrated the economies to be gained by large scale or mass production and by the application of modern industrial methods to dwelling construction. They have proved the superior efficiency of multi-family buildings covering a small percentage of the site over single family houses on the usual small lots, even on cheap land. These projects offer constructive suggestions with respect to the problems of the slum. The eradication of the worst areas in the larger cities can best be accomplished by means of definitely planned and progressive reconstruction of those areas. However, reconstruction in the center must be combined with efforts toward the decentralization of industry and population. This requires the provision of facilities for industry and adequate living in new communities planned and developed for the most economic functioning of the community as a whole.

CHILD WELFARE

By C. C. Carstens

Executive Director, Child Welfare League of America

Legislation.—But few legislative sessions were held during 1928. Both Kentucky and Mississippi passed laws making legal provision for aid to mothers with dependent children. Forty-five states, the District of Columbia, Alaska, and Hawaii now have such provision. Kentucky also created a State Children's Bureau to take the place of its Child Welfare Commission. Georgia and Oklahoma were admitted to the Birth Registration Area, which is accorded to states registering more than 90 per cent of births.

The Fifth Pan American Child Welfare Congress was held at Havana, Cuba, in December, 1927. Many American child welfare workers attended the International Child Welfare Congress in Paris in July, 1928. The United States Government was represented at both. The United States Congress also authorized the United States to become a member of the International American Institute for the Protection of Childhood at Montevideo, Uruguay, and made an annual appropriation of $2,000 toward its work.

The Wisconsin Children's Code Committee was active during the year for the purpose of developing a new series of bills dealing with children's welfare for that State to be presented to the Legislature.

INFANT MORTALITY

Washington.—The total infant mortality rate for 1927 in the City of Washington was reported as 65.7 deaths per 1,000 live births, the rate for white infants being 47.5, and for colored infants, 107.4. These are a substantial decrease from the average of 1924-1926, which was 82.7 for the total rate.

City Group.—The infant mortality rates in cities reported for 1927 were the lowest ever recorded. For the 683 cities in the Birth Registration Area the rate was 64.9 per thousand live births as compared with 73.7 for 613 cities reporting in 1926. Among the cities of 250,000 population and over Seattle had the lowest rate, 41, and New Orleans the highest, 88. In cities of 100,000 to 250,000 Bridgeport, Conn., had the lowest rate, 43, and Fort Worth, Tex., the highest, 94. In cities having 50,000 to 100,000 population East Orange, N. J., had the lowest rate, 26, and Portsmouth, Va., the highest, 154. In cities of 25,000 to 50,000 population Alameda, Cal., had the lowest rate, 9, and Columbus, Ga., the highest, 139. In the group of smaller cities, 10,000 to 25,000 population, Summit, N. J., had the lowest rate, 15, and New Bern, N. C., the highest, 199. The combined rate for cities over 250,000 population was 63.1, while that for the smaller cities, ranging from 10,000 to 25,000, was 68.2.

HEALTH ACTIVITIES

Infantile Paralysis.—A recent increase in infantile paralysis has called attention once more to the need for its study and prevention. During the year substantial gifts have been made for its study in California and in New York. Gifts for more general purposes during the year include those of two and a half million dollars to the Children's Hospital of Cincinnati, a million dollars to Yale University for the study of children's diseases and child life, and a legacy to the city of Boston of $350,000 for additional recreational facilities.

Fargo (N. D.) Child Health Demonstration, carried on for five years, has been brought to a close. All essential activities of the Demonstration health program are to be continued by the city. Its budget for a health department and for health education in the public schools now calls for $1.13 per capita, compared to an expenditure of 28 cents per capita five years ago. The American

Public Health Association recently rated the city's health administration at 827 points out of a possible 1,000 as against 320 before beginning the demonstration.

Cholera Infantum.—The New York City Department of Health calls attention to "cholera infantum" as a great menace to child life. While twenty years ago about 4,000 children under five years of age died each summer of that disease in New York, with a population one-half greater, only 246 died of diarrhœal diseases in 1927.

EDUCATIONAL

Crippled Children.—Additional provision has been made for physically handicapped children. The Michael Dowling School for Crippled Children has been opened in Minneapolis, and the New York Board of Education has established ten new open-air classes in addition to the 167 previously existing. Ten additional teachers have been assigned to work with crippled children in their homes, in addition to 52 home teachers and 24 after-school home teachers for the 440 home-bound children. Three new cardiac class teachers were also appointed.

LABOR PROVISIONS

Work Permits.—New Jersey has raised its educational requirements for work permits to include the completion of the sixth grade. Unfortunately for child welfare, twenty-two states still require less than this.

Compensation Awards.—Of the 98,984 industrial accidents for which compensation was awarded in the State of New York in the year ending June 30, 1927, 10 per cent were for injuries to children under twenty-one years. Machinery was the chief cause of the accident, in spite of the fact that there are many machines which minors are forbidden by law to operate.

Street Trades.—In Tulsa, Oklahoma, a study of children in the street trades was made. Street selling and junk collecting presented the most serious problems. The majority were from broken homes and were not working for economic reasons. There was a greater school retardation among these children than among others.

School Attendance.—Ninety-seven per cent of the 14 and 15 year old children were in the schools of nine towns and cities of Indiana that were studied, and also two-thirds of the 16 and 17 year olds, to whom the compulsory law does not apply, were in school. About 9 per cent of the total enrolment was employed outside of school hours.

New York passed a new compulsory school attendance and employment certificate law, improving the administrative provisions of the previous statute but lowering the age of requirement of attendance at continuation schools from eighteen to seventeen years.

There is evident a growing tendency among city school systems to make provision for children of preschool or nursery age.

Working Hours.—Rhode Island recently reduced the hours of labor in manufacturing, mechanical and mercantile establishments from ten per day and fifty-four hours per week to nine per day and forty-eight hours per week. Night work prohibition for children under sixteen years now begins at the hour of 7 P.M. instead of 8 P.M.

A new child labor law for the District of Columbia has established a minimum of fourteen years for those permitted to work; an eight hour day and a forty-eight hour week for children between 14 and 18. Street trading has a minimum of twelve years and ten years for boys delivering newspapers on regular routes.

MISCELLANEOUS

Recreation.—It has recently been estimated that children constitute 8 per cent of the motion picture audiences in New York City. Using this low figure as a basis, a calculation based on the total weekly attendance of 90,000,000 motion picture visitors throughout the country would give us 7,200,000 children's admissions every week.

The total expenditure for public

recreation as reported by 658 cities to the Playground and Recreation Association of America was more than $32,000,000. The number of paid leaders increased from 10,867 in 1922 to 19,825 in 1927.

Indian Children.—The records of 21,637 boys and girls in the Federal Indian Schools, representing 80 tribes, have led to a compilation of new height-weight-age tables, as they apply to Indian children. These children were found to be shorter as well as heavier than white children of the same age. Indian boys are from one to four inches shorter and one to six and a half pounds heavier than white boys; Indian girls one to four inches shorter and one and a half to four and a half pounds heavier than white girls.

Philippine Marriage Law.—A new marriage law has been passed in the Philippines. The minimum marriage age has been raised from fourteen for boys and twelve for girls to sixteen for boys and fourteen for girls. Notice of intention to marry must be given ten days before the ceremony unless banns are required by their religion. The written consent of parent or guardian is required for the marriage of a male under twenty and a female under eighteen.

Guidance Clinics.—Additional child guidance clinics have been established in various cities, notably in Colorado Springs and in Burlington, Vt.

Case Work.—There has been increasingly large development of case work service in its various forms in connection with institutions for dependent children, and notably in connection with the Presbyterian Orphans' Home at Barium Springs, N. C.

Mothers' aid is now granted by the Tuttle-Newton Home, Augusta, Ga., the Hebrew Orphans' Home, Atlanta, and the Masonic Orphans' Home, Macon, Ga.

Pleasantville Home.—The Hebrew Sheltering Guardian Society of New York reports that during the past ten years it has reorganized its care of children. Originally it had 1,400 children in its cottages at Pleasantville, N. Y. It has now also developed boarding home care, so that on June 30, 1927, it had 251 children in its cottage institution and 709 under the Home Bureau for foster home care. A number of the cottages have been closed.

CHILD LABOR

By Wiley H. Swift

Acting General Secretary, National Child Labor Committee

NEW LEGISLATION

Although the legislatures of only 9 states, and the United States Congress, were in session during 1928, bills to amend the child labor and compulsory school attendance laws were introduced in 8 states and in Congress for the District of Columbia. Legislation to raise the standards of the Massachusetts law was defeated.

District of Columbia.—The provisions of the child labor law were materially strengthened. The poverty exemption for children of 12 was removed; the 8-hour day, 48-hour or 6-day week was extended to all minors under 18; the night work prohibition was extended to 7 A. M.; the standards for work permits were raised; the employment of persons under 16, and between 16 and 18, in certain dangerous occupations was prohibited; and the age for street trades was raised to 18 for girls and 12 for boys, except boys of 10 delivering on fixed routes.

Kentucky.—An amendment to the compulsory school attendance law strengthened the administrative and enforcement provisions and set a maximum fine of fifteen dollars for violation.

New Jersey.—A law, to become effective in September, 1929, raises the educational requirement for work

permits from completion of the fifth to the sixth grade or completion of a year's program beyond the fifth grade in a pre-vocational or vocational school.

New York.—The compulsory school attendance and the child labor laws were entirely rewritten so as to strengthen and harmonize the two. The most important changes include the requirement of employment certificates for all children under 17; barring of parents' affidavits as proof of age; limitation of the use of vacation permits; the extension of the street trades provision to 18 for girls, inclusion of bootblacks in the law, and prohibition of such work after 7 P. M.

Rhode Island.—The hours of work for children under 16 years were reduced to 9 a day and 48 a week; night work was prohibited after 7 P. M.; and the application of the street trades law extended to all cities of 40,000 population and over.

South Carolina.—Both Houses passed a measure changing the compulsory school attendance age from 8 to 14 to 7 to 14; the time of attendance from four consecutive months, or eighty days, to attendance for the full term provided the term does not exceed six months; the maximum penalty for violation from ten dollars or ten days in jail, to fifty dollars or thirty days in jail; and providing an appropriation for attendance officers. Children of 10 years or over are exempt in cases of necessity. Formerly the poverty exemption applied to children 12 or over. The Governor vetoed the appropriation item but the rest of the bill is still awaiting his consideration.

Virginia.—A School Code was adopted which, among other things, changes the compulsory school age from 8 to 14 to 7 to 15 with a provision giving power to the local boards of education to make this 8 to 16, all children being required to attend unless they have completed the elementary course. Jurisdiction of the violation of the compulsory attendance law is given to juvenile and domestic relations courts where established, and in all cases children who are kept out of school may be proceeded against as neglected children.

Proposed Constitutional Amendment.—During 1928, the proposed Federal child labor amendment was considered in only one state, New York, where a resolution to ratify died in Committee.

NEW INVESTIGATIONS

Among the important investigations of child labor made during 1928 are a study of the enforcement of the child labor and school attendance laws in Mississippi by the National Child Labor Committee, a study of street trades made by the Federal Children's Bureau, and a study of fourteen and fifteen year old children in industry, conducted by the Bureau of Women and Children of the Pennsylvania Department of Labor and Industry.

BIBLIOGRAPHY

The American Child is a monthly publication of the National Child Labor Committee devoted entirely to child labor and related problems. Among the most important publications of 1928 dealing with child labor are the following: Consumers' League of Cincinnati, *A Study of Industrial Injuries to Working Children in Cincinnati during 1926;* National Child Labor Committee, *Child Labor and the Future.* A reprint from "The New Republic," March 21, 1928; National Child Labor Committee, *Child Labor Facts, 1928;* National Child Labor Committee, *Proceedings of the Twenty-Fourth Annual Meeting of the National Child Labor Committee Held in Memphis, Tennessee, May 4, 1928;* Pennsylvania Department of Labor and Industry, *Fourteen and Fifteen Year Old Children in Industry.* Bureau of Women and Children, Pennsylvania Department of Labor and Industry; Pennsylvania Department of Labor and Industry, *Opportunities and Conditions of Work for Minors Under Eighteen in the Glassware Industry.* Bureau of Women and Children, Pennsylvania Department of Labor and Industry; U. S. Department of Labor, Children's Bureau, *Fifteenth Annual Report of the Chief of the Children's Bureau for the Year*

ending June 30, 1927; U. S. Department of Labor, Children's Bureau, *Children in Street Work.* Publication No. 183.

SOCIALISM

By Algernon Lee

Educational Director, Rand School of Social Science

PARTIES

The Socialist parties of different countries, though essentially alike in principles and purposes, and nearly all of them affiliated with the Labor and Socialist International, do not all bear the same name. Thus we have the Socialist party and Socialist Labor party in the United States, the Labor party in Great Britain and Belgium, the Social Democratic party in Germany. They are sharply distinguished from the Communist parties, which are affiliated with the Communist or "Red" International. Present-day Communism originated as a secession from the Socialist movement about 1919-20. The relations between Socialists and Communists are as a rule bitterly hostile. The Communist organization in the United States is known as the Workers' party.

THE PRESIDENTIAL CAMPAIGN

Convention and Nominations.—The Socialist party held its national convention in New York City, April 13 to 18. Norman Thomas of New York, one of the leading figures in the League for Industrial Democracy (the former Intercollegiate Socialist Society), was nominated for President; the nominee for Vice-President was James H. Maurer, for many years president of the Pennsylvania Federation of Labor and now one of the city commissioners of Reading, which city was carried by the Socialists in 1927.

Party Officers.—Victor L. Berger, of Wisconsin, was made chairman of the party, and Morris Hillquist of New York was reëlected to represent it in the International Socialist Bureau. While the national office of the party remains at Chicago (2653 Washington Blvd.) with William H. Henry of Indiana as executive secretary, campaign headquarters were set up in New York, with G. August Gerber, director of WEVD (the Debs Memorial radio station), in charge.

Campaign Activities.—The effects of the war and especially the subsequent Communist schism had greatly weakened the party, and its organization was further demoralized by its virtual merging in the Conference for Independent Political Action in support of the candidacy of Robert M. LaFollette in 1924. It faced the campaign of 1928 with a rock-bottom membership and a bankrupt treasury. A vigorous campaign was nevertheless carried on by means of public meetings, literature, and radio talks. The attention given to it by the daily press throughout the country indicated respectful interest on the part of large sections of the public. The party membership was considerably increased during the campaign, but the vote was disappointingly small, numbering only 268,000. The one Socialist congressman, Mr. Berger, was defeated by a narrow plurality.

The Socialist Labor party, a minor organization which has for thirty years existed side by side with the Socialist party, polled 21,000 votes for its presidential candidate, Verne L. Reynolds.

INTERNATIONAL CONGRESS

The Labor and Socialist International held its trienniel congress at Brussels, August 5 to 11, with delegates from more than thirty countries. It gave much of its time to consideration of methods of combatting militarism and the war danger and strengthening the bonds of common interest and ideals among the working classes of all nations. American intervention in Nicaragua and

British interference in Egyptian affairs were condemned as instances of imperialist aggression. The workers of China and other Oriental countries were invited to organize and affiliate with the International. Fascist rule in Italy and similar tendencies in other countries were declared to constitute a grave danger to the peace of Europe and to political democracy and trade unionism. Communism or Bolshevism was recognized as an equal peril on the other side. Socialist and Labor elements everywhere were urged to work for diminution of armaments in their respective countries as well as for a world-wide policy of disarmament and arbitration. Especially in those countries which have colonial possessions they were called upon to support a program which provides for protection of the natives from oppression and exploitation by colonial authorities and concessionaires and for the development of autonomous self-government to the point eventually of national independence and world-federation. Approval was given to a model program of measures for protection of working women, abolition of child labor, maternity insurance, and so on, in all industrial countries, prepared by the Women's International Congress.

SOCIALISM IN BRITISH EMPIRE

Great Britain.—The Labor party won two more seats in parliamentary by-elections in 1928, giving it a net gain of eight seats in the 54 such elections held since 1924. Still more striking were the successes won in municipal contests all over the country, which added about 180 to the number of Laborites in city councils. The annual congress of the British Co-operative Societies, representing more than 3,000,000 members, reaffirmed the decision made in 1927 to affiliate with the Labor party.

The Labor group was of course unable to carry any of its proposals in the House of Commons, where the Conservatives have a two-thirds majority, but it kept up a sharply critical opposition to the Baldwin Government. As the year drew to a close active preparations were being made for the general election which must be held in the summer of 1929. In 1924, out of 16,385,000 votes, the Conservatives or Tories had 7,838,000, the Labor party 5,424,000, and the Liberals 2,925,000. The leading party was much over-represented in Parliament, getting 420 seats, to 150 for Labor and 40 for the Liberals. The trend of the by-elections was generally held to forecast a gain of at least 100 seats for Labor. The minimum voting age for women having been lowered from 25 to 21, the same as for men, the total poll in 1929 is expected to reach 20,000,000, and the effect of the "young woman vote" is regarded as problematical.

The campaign issues emphasized by the Labor party are: repeal of the law carried through by the Baldwin Government restricting the action of trade unions; extension of the system of state aid to the unemployed; shortening of the workday and undertaking of useful public works on a large scale, as means of diminishing unemployment; a law broadening the functions of municipal governments, especially in matters of housing, education, public health, recreation, and municipal trading; nationalization of basic industries, such as mining, transport, and waterpower; and support to all efforts toward disarmament and international arbitration.

Australia.—Elections for the Federal Parliament were held in November. The governing coalition of Nationalist and Country parties won by a reduced majority. The Labor party cast 784,000 out of the total 1,589,000 votes, and increased its representation from 23 members to 32, while the other parties elected 45.

GERMANY AND AUSTRIA

Germany.—Elections for the Reichstag took place in May. The Social Democratic party cast 9,111,000, as against 7,881,000 four years earlier. They elected 153 deputies, out of a total of 492, being a gain of 22 seats. The Socialists being the strongest of the several parties, and it being impossible for any ministry to stand

without their support, the Socialist Hermann Mueller was called upon to become Chancellor with a coalition Cabinet including Socialists, Centrists, Democrats, and the People's party. Gains were made by the Socialists in various state and municipal elections in the course of the year.

The German Socialists have steadily advocated loyal fulfillment of the terms of settlement agreed to after the war and combat all efforts toward restoration of monarchy, cultivation of national hate, or covert arming. They have devoted their energies mainly, and with measurable success, to the gradual restoration of the standards of life and conditions of labor which had been broken down by the war and the subsequent troubles.

Austria.—No general test of party strength took place in Austria in 1928. The Socialists suffered some losses in minor elections in Vienna, but these were more than compensated by gains in the municipal elections held in April in the provinces of Lower Austria, Salzberg, and Carinthia. The Socialists are in full control of the capital, one-third of whose adult inhabitants belong to the party's dues-paying organization. Its program in matters of health, child welfare, education and recreation, aid to working-class mothers, provision for the unemployed, and municipal housing is being vigorously carried forward. The anti-Socialist elements, whose strength is in the rural districts, have shown a tendency to despair of constitutional methods and to pin their hopes on Fascist violence. In October they made a great demonstration, concentrating the Heimwehr (an extra-legal armed force corresponding to the Stahlhelm in Germany) at a point near Vienna. It was expected that this might develop into a repetition of Mussolini's "march on Rome," but the Schutzbund or Republican Defence League, under Socialist leadership, concentrated in still larger numbers and, while carefully avoiding a collision, showed its readiness to meet any attack on the Republican régime. The Austrian Socialist party has this year devoted much attention to an educational campaign against the use of spirituous liquors.

FRANCE

The general elections in April gave the Socialists the same number of seats in the Chamber of Deputies that they had before—101 out of a total of 612. Their progress can best be indicated by the following comparison. In 1919 the Socialist popular vote was 1,615,000. The next year came the Communist secession, which greatly weakened its force. In 1924 the Socialists were in coalition with the Socialist-Radicals and other parties of progress, so that their vote cannot be separated. In 1928 the Socialist popular vote was 1,660,000, while the Communists had 1,069,000, and elected only 14 deputies. They wished to combine with the Socialists for the supplementary elections in the numerous districts where no candidate had received a clear majority at the first polling, but Moscow forbade. The French Socialists have persistently advocated the evacuation of the Rhineland and other measures for healing the wounds left by the war, and have fought to have the military budget reduced and money thus saved applied to purposes of social betterment.

NORTH EUROPE

Poland.—The Socialist party scored a brilliant victory in the March general election, polling more than 1,400,000 votes and increasing its representation in the Seym from 42 to 63; the total membership of this body is 444. The party has worked hand in hand with the Lithuanian Socialists to prevent war over the Vilna question, and has continued its opposition to the Pilsudski dictatorship. On this question a split took place later in the year, five of the Socialist deputies forming themselves into an independent group more favorable to Pilsudski.

Latvia.—Elections were held in October, in which the regular Socialist party lost seven of its seats in parliament, retaining 26 out of the total of 100. The loss was due to internal

dissensions. Two dissident groups, of "right" and "left" tendencies, won three and two seats respectively.

Esthonia.—The proposal of the Esthonian Socialists for amnesty to all political prisoners was rejected by the Ministry and defeated in Parliament, 26 of whose 100 members were Socialists. In December, however, a new government came into power, with a Socialist as Premier, based on a coalition with the New Peasants' party.

Finland.—About the middle of the year the government made wholesale arrests of Communists. The Socialists, who have 60 of the 200 members of Parliament, vigorously opposed this renewal of political persecution. The Swedish Socialist, George Branting, appeared as counsel for the accused. Several of these were nevertheless convicted and given heavy sentences. In December the Socialists in Parliament moved a censure of the government, which was carried with the aid of the Agrarians, and the old Ministry resigned.

SCANDINAVIA

Sweden.—The general elections in September gave a paradoxical result. The Socialist vote, which had been 725,000 at the preceding election, rose to 872,000, but the Socialist group in Parliament was cut from 105 to 90, in a total of 230 seats. This was partly due to an increase of Communist strength, that element getting four more seats than it had before, but more largely to an exceptional turn-out of the "stay-at-homes" on this occasion. The Socialist party membership now exceeds 202,000, an increase of 33 per cent in three years.

Norway.—The Labor party Ministry formed at the beginning of the year lasted only a few weeks. Only 32 of the 150 members of the Storthing are Socialists. The Radicals, with whose aid this Ministry was set up, soon withdrew their support. In municipal elections held toward the end of the year the Socialist or Labor party made large gains at the expense of both the Conservatives and the Communists.

Denmark.—In September the Socialists gained two seats in the Landsthing or upper house of Parliament, giving them 27 out of a total of 76. In the lower house they have 53 out of 149.

Iceland.—Elections for the Althing or Icelandic Parliament resulted in defeat for the Conservatives. The Socialists have five out of 42 members in the newly elected body.

BALKAN COUNTRIES

Rumania.—The general election in December, whose outstanding result was the crushing defeat of the Bratianu régime by the Peasant party, brought also nine Socialists into the Parliament. They announced that their immediate program would include advocacy of general pardon and amnesty to political offenders, reform of the election law to prevent fraud and intimidation, and improvement in the matter of the health insurance law.

Bulgaria and Yugoslavia.—The reign of governmental and factional violence in Bulgaria and Yugoslavia prevents any free development of the Socialist movement. The Socialist parties of both countries, though subjected to continual persecution, maintain their existence and have during the year taken every opportunity to advocate the formation of a Federal republic, with democratic institutions and regional autonomy for Bulgarian, Macedonian, Serbian, Croatian, and other national elements.

COGNATE SOCIETIES

JUSTICE AND MAINTENANCE OF ORDER

AMERICAN BAR ASSOCIATION.—Section on Criminal Law, Endicott Bldg., St. Paul, Minn.

AMERICAN COUNCIL OF LEARNED SOCIETIES.—907 Fifth Ave., New York, N. Y.

AMERICAN PRISON ASSOCIATION.—135 E. 15th St., New York, N. Y.

AMERICAN CIVIL LIBERTIES UNION.—100 Fifth Ave., New York, N. Y.

American Institute of Criminal Law and Criminology.—357 East Chicago Ave., Chicago, Ill.

American Law Institute.—3400 Chestnut St., Philadelphia, Pa.

National Committee on Prisons and Prison Labor.—730 Fifth Ave., New York, N. Y.

National Crime Commission.—120 Broadway, New York, N. Y.

National Police Conference.—240 Centre St., New York, N. Y.

National Probation Association, Inc.—370 Seventh Ave., New York, N. Y.

Society for the Prevention of Crime.—1819 Broadway, New York, N. Y.

Women's Prison Association.—110 Second Ave., New York, N. Y.

SOCIAL ORGANIZATIONS

American Academy of Political and Social Science.—3622 Locust St., West Philadelphia, Pa.

American National Red Cross.—17th and D. Streets, N. W., Washington, D. C.

American Seamen's Friend Society.—72 Wall St., New York, N. Y.

American Society for the Prevention of Cruelty to Animals.—50 Madison Ave., New York, N. Y.

American Society for Thrift.—9 East 46th St., New York, N. Y.

Boys' Club Federation.—420 Lexington Ave., New York, N. Y.

Boy Scouts of America.—2 Park Ave., New York, N. Y.

Civic Forum.—123 W. 43rd St., New York, N. Y.

Children's Aid Society.—105 E. 22nd St., New York, N. Y.

Girls Friendly Society in America.—15 E. 40th St., New York City, N. Y.

Girls Service League of America.—138 E. 19th St., New York, N. Y.

Humanitarian League, Inc.—131 W. 74th St., New York, N. Y.

Human Progress Association.—220 W. 42nd St., New York, N. Y.

Intercollegiate Socialist Society.—70 Fifth Ave., New York, N. Y.

National Catholic Welfare Conference.—1312 Massachusetts Ave., N. W., Washington, D. C.

National Conference of Social Work.—25 E. 9th St., New York, N. Y.

National Conference for the Social Studies.—671 Park Ave., New York, N. Y.

National Institute of Social Sciences.—280 Madison Ave., New York, N. Y.

Young Men's Christian Association, International Committee.—347 Madison Ave., New York, N. Y.

SOCIAL FRATERNITIES

Allied Patriotic Societies, Inc.—299 Madison Ave., New York City, N. Y.

Ancient Accepted Scottish Rite of Freemasonry.—Northern Jurisdiction, 117 Statler Bldg., Boston, Mass.—Southern Jurisdiction — 1733 16th St., Washington, D. C.

Benevolent and Protective Order of Elks of the U. S. A.—2750 Lake View Ave., Chicago, Ill.

Independent Order of Odd Fellows.—12 West Chase St., Baltimore, Md.

International Advertising Association.—420 Lexington Ave., N. Y. C.

International Association of Lions Clubs. — 350 McCormick Bldg., Chicago, Ill.

Kiwanis International.—164 W. Jackson Blvd., Chicago, Ill.

Knights of Columbus.—P. O. Box 1670, New Haven, Conn.

Knights of the Ku Klux Klan, Inc.—2621 Peachtree St., Atlanta, Ga.

Knights of Pythias.—754 Security Bldg., Minneapolis, Minn.

Loyal Order of Moose.—Mooseheart, Ill.

Modern Woodmen of America.—1504 3rd Ave., Rock Island, Ill.

Royal Arcanum Supreme Council.—407 Shawmut Ave., Boston, Mass.

Rotary International.—211 W. Wacker Drive, Chicago, Ill.

Woodmen of the World, Sovereign Camp.—14th and Farman Sts., Omaha, Neb.

(SOCIAL) HOME LIFE

Landlords' Cooperative Association.—116 Nassau St., New York, N. Y.

National Housing Association.—105 E. 22nd St., N. Y. C.

National Plant, Flower & Fruit Guild.—70 Fifth Ave., New York, N. Y.

New York Associatin for Improving the Condition of the Poor.—105 E. 22nd St., New York, N. Y.

Own-Your-Home Educational Campaign Foundation.—524 First Ave., New York, N. Y.

Own Your Home League, Inc.—151 W. 33rd St., New York, N. Y.

(SOCIAL) CHILDREN

National Child Welfare Association.—70 Fifth Ave., New York, N. Y.

American Country Life Association.—Amherst, Mass.

Big Brother Movement, Inc.—315 Fourth Ave., New York, N. Y.

Big Brother and Big Sister Federation, Inc.—425 Fourth Ave., New York, N. Y.

Camp Fire Girls, Inc.—31 E. 17th St., New York, N. Y.

Child Conservation League of America.—205 W. Monroe St., Chicago, Ill.

Children's Aid Society.—105 E. 22nd St., New York, N. Y.

Child Welfare League of America.—130 E. 22nd St., New York, N. Y.

Hebrew Sheltering Guardian Society of New York.—Pleasantville, N. Y.

National Child Labor Committee.—215 Fourth Ave., New York, N. Y.

Santa Claus Association, Inc.—Knickerbocker Bldg., 42nd St. & Broadway, New York, N. Y.

(SOCIAL) HEALTH

American Birth Control League.—104 Fifth Ave., New York, N. Y.

American Child Health Association.—370 Seventh Ave., New York, N. Y.

American Mission to Lepers.—156 Fifth Ave., New York, N. Y.

American Posture League, Inc.—1 Madison Ave., New York, N. Y.

American Social Hygiene Association, Inc.—370 Seventh Ave., New York, N. Y.

Anti-Cigarette League of New York State.—209 W. 107th St., New York, N. Y.

Benevolent Society of the United States for the Propagation of Cremation.—1828 Barnes St., New York, N. Y.

Committee on Dispensary Development.—151 5th Ave., New York, N. Y.

Eugenics Research Association.—Cold Spring Harbor, L. I., New York.

National Health Council.—370 Seventh Ave., New York, N. Y.

National Committee for the Disabled.—245 E. 23rd St., New York, N. Y.

National Housing Association.—105 E. 22nd St., New York, N. Y.

Playground and Recreation Association of America.—315 Fifth Ave., New York, N. Y.

(SOCIAL) MORALS

American Association of Social Workers.—130 E. 22nd St., New York, N. Y.

American Fund for Public Service, Inc.—2 W. 13th St., New York, N. Y.

American Humane Association.—80 Howard St., New York, N. Y.

Anti-Profanity League. — Ware, Mass.

Charity Organization Society of the City of New York.—105 E. 22nd St., New York, N. Y.

Chicago Crime Commission.—300 W. Adams St., Chicago, Ill.

Morality League of America.—222 Madison Ave., New York, N. Y.

National Christian League for Promotion of Purity.—5 E. 12th St., New York, N. Y.

National Committee for Better Films.—70 Fifth Ave., New York, N. Y.

National Save-a-Life League, Inc.—50 E. 42nd St., New York, N. Y.

New York Society for the Suppression of Vice.—215 W. 22nd St., New York, N. Y.

Non-Smokers' Protective League of America.—101 W. 72nd St., New York, N. Y.

Safety First League.—47 W. 47th St., New York, N. Y.

Travelers Aid Society of N. Y.—144 E. 44th St., New York, N. Y.

(SOCIAL) TEMPERANCE

ASSOCIATION AGAINST THE PROHIBITION AMENDMENT.—1523 L. St., N. W., Washington, D. C.

ANTI-SALOON LEAGUE OF AMERICA.—370 Seventh Ave., New York, N. Y.

CATHOLIC TOTAL ABSTINENCE UNION OF AMERICA.—Pittsburgh, Pa.

INTERNATIONAL NARCOTIC CRUSADE, INC.—156 Fifth Ave., New York, N. Y.

MODERATION LEAGUE, INC.—385 Madison Ave., New York, N. Y.

NATIONAL TEMPERANCE SOCIETY.—289 Fourth Ave., New York, N. Y.

WORLD LEAGUE AGAINST ALCOHOLISM.—150 Fifth Ave., New York, N. Y.

FOUNDATIONS

CARNEGIE FOUNDATION.—522 Fifth Ave., New York, N. Y.

CARNEGIE ENDOWMENT FOR INTERNATIONAL PEACE.—2 Jackson Place, Washington, D. C.

CARNEGIE HERO FUND COMMISSION.—2307 Oliver Bldg., Pittsburgh, Pa.

CARNEGIE INSTITUTION OF WASHINGTON.—16th and P. Sts., N. W., Washington, D. C.

GENERAL EDUCATION BOARD. — 61 Broadway, New York, N. Y.

GUGGENHEIM FOUNDATION.—551 Fifth Ave., N. Y. C.

HALL OF FAME FOR GREAT AMERICANS.—University of the City of New York, N. Y.

LAURA SPELLMAN FOUNDATION.—61 Broadway, N. Y. C.

MORO EDUCATIONAL FOUNDATION.—475 Fifth Ave., New York, N. Y.

ROCKEFELLER FOUNDATION. — 61 Broadway, N. Y. C.

ROCKEFELLER INSTITUTE.—Ave A & 66th St., N. Y. C.

ROOSEVELT MEMORIAL ASSOCIATION.—20 E. 20th St., New York, N. Y.

RUSSELL SAGE FOUNDATION.—130 E. 22nd St., New York, N. Y.

WOODROW WILSON FOUNDATION.—17 E. 42nd St., New York, N. Y.

WOMEN'S WORK AND PROGRESS

WOMEN'S EDUCATIONAL AND INDUSTRIAL UNION.—264 Boylston St., Boston, Mass.

AMERICAN ASSOCIATION OF UNIVERSITY WOMEN.—1634 I. St., N. W., Washington, D. C.

AMERICAN NURSES' ASSOCIATION.—370 7th Avenue, New York, N. Y.

AMERICAN WOMAN'S ASSOCIATION, INC.—220 Madison Ave., New York, N. Y.

CHURCH WOMEN'S LEAGUE FOR PATRIOTIC SERVICE, INC.—132 E. 57th St., New York, N. Y.

GENERAL FEDERATION OF WOMEN'S CLUBS.—1734 N. St., N. W., Washington, D. C.

NATIONAL AMERICAN WOMAN SUFFRAGE ASSOCIATION.—171 Madison Ave., New York, N. Y.

NATIONAL ASSOCIATION OF WOMEN PAINTERS AND SCULPTORS.—17 E. 62nd St., New York, N. Y.

NATIONAL COUNCIL OF ADMINISTRATIVE WOMEN IN EDUCATION.—1211 Gilpin Ave., Wilmington, Del.

NATIONAL COUNCIL OF WOMEN, U. S. A.—370 7th Ave., N. Y. C.

NATIONAL FEDERATION OF COLLEGE WOMEN.— Rolla, Mo.

NATIONAL LEAGUE OF GIRLS' CLUBS.—472 W. 24th St., New York, N. Y.

NATIONAL LEAGUE OF WOMEN VOTERS.—532 Seventeenth St., N. W., Washington, D. C.

NATIONAL WOMAN'S CHRISTIAN TEMPERANCE UNION.—1730 Chicago Ave., Evanston, Ill.

NATIONAL WOMAN'S RELIEF CORPS.—64 Spring St., Oberlin, Ohio.

NATIONAL WOMAN'S PARTY.—21 First St., N. E., Washington, D. C.

PROFESSIONAL WOMEN'S LEAGUE.—56 W. 53rd St., New York, N. Y.

SOUTHERN WOMEN'S EDUCATIONAL ALLIANCE.—Hotel Richmond, Richmond, Va.

WOMEN'S CHRISTIAN TEMPERANCE UNION.—1730 Chicago Ave., Evanston, Ill.

WOMEN'S EDUCATIONAL AND INDUSTRIAL UNION.—264 Boylston St., Boston, Mass.

WOMAN'S ROOSEVELT MEMORIAL ASSOCIATION.—Roosevelt House, 28 E. 20th St., New York, N. Y.

WOMEN'S TRADE UNION LEAGUE.—247 Lexington Ave., New York, N. Y.

DIVISION XVI

LABOR AND LABOR LEGISLATION

CONDITIONS OF LABOR AND LABOR ORGANIZATIONS

By Ethelbert Stewart

United States Commissioner of Labor Statistics

TRADE-UNION PROGRESS

The year 1927-28 has, on the whole, been one of quiet gradual progress for the trade-union movement. Some increases in wages have been effected. Considerable advance has been made toward the five-day week, with more than 165,000 trade-unionists, members of the American Federation of Labor, now working on that basis and several other internationals having reported that they are now conducting negotiations aiming toward that end.

The American Federation of Labor reports an increase in individual membership of from 2,812,526 in 1927 to 2,896,063 in 1928. Data are not available for the individual affiliated unions, but of 104 national or international organizations for which membership as indicated by voting strength in the American Federation of Labor is given, 33 had an increase in membership, 22 a decrease, and in 49 there was no change.

Conditions in the mining industry, the textile industry, glass industry, and others have had their effects upon the unions in those industries, while in other cases divisions within the union itself have resulted in more or less disorganization and loss of ground.

COURT DECISIONS AND LEGISLATION

General.—By contrast with the situation during 1926-27, when organized labor received several severe judicial setbacks, notably in the Bedford Cut Stone Company decision and the Pennsylvania Supreme Court decision upholding the right of coal operators to evict striking miners from company houses, during the year 1927-28 there were no outstanding decisions affecting the status of organized labor. The right of the Brotherhood of Railway Clerks to act as representative of the workers of the American Express Company, instead of a company union set up by the latter, was upheld.

Injunctions continue to be issued in labor disputes, restraining the workers in what the unions regard as legitimate practices. The general indignation in labor circles resulted in the introduction by Senator Shipstead of Minnesota of a measure designed to curb the use of injunctions for such purposes. This bill was rewritten and greatly expanded by a Senate subcommittee appointed for the purpose. If passed, it will not only remedy the situation as to labor disputes but will also make unlawful the use of the so-called "yellow dog" contract which the unions have fought so bitterly. (By these contracts the worker agrees not to retain membership in, or to join a labor union as long as he remains in the employ of the company.) These will be two sweeping victories for the labor movement, if the legislation is passed.

Old-Age Pensions.—Measures providing for a public system of old-age pensions have been introduced in the legislatures of a number of states and these are receiving the support of organized labor. Laws providing for such a system have already been

passed in six states (Colorado, Kentucky, Maryland, Montana, Nevada, and Wisconsin) and in Alaska.

RELATIONS BETWEEN CAPITAL AND LABOR

Coal and Textile Strikes.—In general the past year has been, with a few outstanding exceptions, one of comparatively peaceful relations between capital and labor. The number of strikes occurring during 1927 was very much lower than in any year since the systematic compilation of strike data was begun (1916). The most important economic disturbance of this sort which occurred was the strike of the bituminous-coal miners involving practically all of the soft-coal fields in varying degree. This strike began in April, 1927, and was settled (only in part) by the early fall of 1928; it involved more than 175,000 men in the various fields. Another strike of long duration was that of the textile workers in New Bedford, Massachusetts, called April 16, 1928, which was not settled until October 6, 1928.

Mining Conditions.—A strike of widespread interest was that of the coal miners of Colorado, conducted at the call of the I. W. W., which began October 18, 1927, and was concluded February 19, 1928. This strike drew the attention of the Colorado Industrial Commission to the conditions prevailing in the coal mines and resulted in an extensive study by that commission. Its report scored the employers for their refusal to allow the men to be represented by persons of their choice in the negotiations with the operators and called attention to a number of conditions which needed remedy. An interesting aftermath of the strike was an agreement signed by the leading operator with the organization, the United Mine Workers, establishing an orderly procedure of relations as well as improved physical conditions in connection with the work, which are innovations in the coal-mining industry.

Clothing Controversy.—A novel means of winning a strike was resorted to in one case. After many years of relations with the Amalgamated Clothing Workers, David Adler & Sons, of Milwaukee, suddenly broke off relations early in April, 1928, though the agreement had not yet expired. The union retaliated by withdrawing all its members (800) from the plant. This dispute has been in progress ever since. Recently, by arrangements entered into between the union and Hart, Schaffner & Marx, perhaps the largest manufacturers of men's clothing in this country, a new shop has been established. It will be manned by members of the union now on strike against the Adler Company. The work will be furnished by Hart, Schaffner & Marx and will consist of new lines not now being manufactured by that firm. This is the first time to our knowledge that a union firm has coöperated in this way to bring a non-union competitor into line.

Mitten Settlement.—A controversy of 20 years' standing was brought to a close early in 1928 by the signing of an agreement between the Mitten Management and the Amalgamated Association of Street and Electric Railway Employees, by which the company agrees to recognize the union on all lines hereafter to be taken over, and on the Philadelphia system as soon as two-thirds of the employees so vote.

General.—In general it may be said that the spirit of coöperation on the part of labor organizations, mentioned in last year's report, continues, with new unions being won to the idea.

JURISDICTIONAL DISPUTES

Further progress is reported in the settling of jurisdictional disputes between unions. Among the disputes in which a satisfactory settlement was reached were the following: Between the teamsters and the railway clerks; between the boilermakers and the structural-iron workers; between the machinists and the street-railway employees; between the stove mounters and the sheet-metal workers; and between the carpenters and sheet-metal workers. Disputes were still unsettled between the electrical workers and the railroad signalmen (the latter

have been suspended from membership in the American Federation of Labor for refusal to comply with the decision of the convention); between the flint glass workers and the machinists; and between the tunnel and subway constructors and the hodcarriers and building laborers.

NEW PROBLEMS

Separatist Movement.—Besides the ever-present problem of the unionization of unorganized workers, there has developed an internal situation threatening the well-being of the labor movement. A "separatist" movement is manifesting itself. This has become evident in the miners' union, where dissatisfaction with the old leadership and the results obtained thereunder has resulted in the formation of a new miners' union. Communist activity in the ranks of such unions as those of the furriers, textile workers and ladies' garment workers has resulted in a division of strength of the organization and in some instances in expulsion of the dissenting group.

Absorption of Workers.—The rapid expansion of machinery and the mass production possible under present conditions have created new problems for the unions. Where possible they are endeavoring to insure the employment of union men on the new machines, educating their members in the new processes and procedure as intensively as possible. But fewer and fewer men are necessary for the production of a greater and greater output. The problem then becomes, first, what to do with the workers thus displaced, and second, how to dispose of the surplus goods produced under the system of mass production. True, new industries are arising, but whether these will prove adequate to absorb the displaced workers is a question.

SOCIAL AND PROTECTIVE MEASURES

Benefits.—Nearly all of the stronger national and international unions have made provision, either independently or in coöperation with the employer, for various social or welfare benefits to their members. These include payments in case of strike or lockout, unemployment, death, sickness, disability, tuberculosis, etc.; in some cases, also, provision is made for aged members through the establishment of an old-age pension, or home for the aged, or both. Millions of dollars in this way are disbursed annually to trade-unionists by the labor organizations. The year 1926-27 has been marked by increased measures to provide protection for members and their families.

Old Age Pensions.—A number of conventions—both of state federations and of international unions—have during the past year definitely indorsed the principle of public old-age pensions. Two others, International Brotherhood of Electrical Workers and the United Brotherhood of Carpenters and Joiners, have recently adopted pension plans of their own. Thus there are now eleven international unions which have old-age pension schemes. That of the electrical workers was adopted during 1927 but was not put into effect until January, 1928, while that of the carpenters becomes effective April 1, 1929.

Homes For Aged.—Late in 1927 the new home for aged members of the Brotherhood of Railway Conductors was opened near Savannah, Georgia. A similar home has been built for the use of superannuated members of the United Brotherhood of Carpenters and Joiners which is expected to be opened in Lakeland, Florida, early in 1929. There are now seven labor organizations operating such homes.

Sick and Death Benefits.—The provision in the collective agreement of the street-railway employees of the elevated lines in Chicago effective since 1926, by which the employing company provides sick and death benefits for the employees covered by the agreement continues. A similar provision has recently been incorporated into the agreement with the surface employees of the same city, while on any lines hereafter taken over by the Mitten Management the company will contribute $1 per man per month toward the union benefits.

Widows and Orphans.—Another step was taken toward the realization of the plan of the International Printing Pressmen of Assistants' Union to establish a colony for the widows and orphans of its deceased members, when the 1928 convention of the union voted to assess each member $12 a year for three years for this purpose. Donations of $1,000 and $100,000, respectively, have been received for the colony from two interested employers.

INSURANCE

General.—Several international unions have increased the amounts of benefits or insurance allowed or have so modified the eligibility requirements as to increase the coverage within the membership. At the same time labor organizations have begun to pay more attention to the actuarial safety of their funds and have had their whole benefit plan subjected to scrutiny to determine whether it is sound. This matter has been brought to the fore by the rise of the general trade-union insurance companies operated on regular insurance lines.

Company Finances.—The two labor union insurance companies have continued to expand during the past year. The older of the two companies, the Union Coöperative Insurance Company, had in force in January, 1928, insurance aggregating $46,000,000 and assets of $332,000, and paid a 4 per cent dividend on the capital stock. The Union Labor Life Insurance Company, which began to write insurance in July, 1927, had, in March, 1928, individual insurance in force totaling $1,223,000 and group insurance of $34,000,000. It closed the year with a surplus of $209,506 and total assets of more than $618,000.

Unemployment Benefits and Insurance.—Some unions pay unemployment benefits to their members who are out of work, making disbursements for this purpose from the general trade-union funds. The unions in the clothing trades in which unemployment is an ever-present problem cannot, because of the very magnitude of the problem, carry this burden alone. They have therefore made one of their main objectives the securing of "unemployment insurance," maintained from contributions from both unions and employers. The essence of the plan is that a certain number of weeks' employment in each year or half year is guaranteed to each permanent worker in the industry. Failing this, he receives benefits from the joint fund in proportion to his earnings. Certain incentives are also offered to make it worth the employers' while to provide as much work as possible.

Although unemployment insurance schemes had been secured by agreement with the employers in the men's clothing industry, the ladies' garment industry, and the fur industry, only in the first have they been maintained. Factional troubles within the union have in the last two cases resulted in the loss, at least temporarily, of the unemployment insurance provision. In the men's clothing industry, however, not only has the union been able to retain this measure; it has been successful in having the unemployment insurance, heretofore actually in existence only in the Chicago market, introduced into the Rochester and New York City markets, while at the same time the employers' share of the cost of the scheme in Chicago has been increased from one-half to two-thirds. It is the union's avowed policy to extend this plan into each of the other men's clothing markets as fast as conditions will permit.

HEALTH AND RECREATION

Safeguards.—Measures to safeguard the health of the members in the shop have long been a concern of organized labor. During the past few years, however, the physical well-being of the individual member has been more and more of interest. The work of the Union Health Center of the International Ladies' Garment Workers' Union is well known to students of organized labor. During the past year its services have been thrown open to members of all unions, regardless of trade, and many locals in New York City where the

Center is located have formally affiliated with it.

Dental Clinic.—A dental clinic forms part of the facilities of the new temple of the Chicago locals of the Amalgamated Clothing Workers, and the Cincinnati locals of that organization, which have heretofore had a contract with a local institution, have decided to install dental units in their own offices and carry on this work through their own organization hereafter.

Health Conference.—The preoccupation of the labor movement in the conditions of their members found expression in a health conference held in 1927, under the auspices of the Workers' Health Bureau. This bureau has, however, been discontinued (late in the summer of 1928), due, it is said, to lack of financial support from the unions.

Recreational Projects.—On the purely social side are the sports, socials and various other recreational activities fostered, mainly by locals. These appear to be growing in popularity and interest, and the summer of 1928 has seen the undertaking of two new recreational projects—a summer camp by the Union of Technical Men, at Monroe, N. Y., and a summer home colony in Illinois by members of the Chicago Federation of Labor. One of the latest developments along this line is the plan for making Labor Day a recognized day for participation in outdoor sports of all kinds, and for the promotion of the spirit of good sportsmanship.

FINANCIAL AND CREDIT ORGANIZATIONS

Loans.—The year 1926-27 has seen very little expansion in the financial activities of labor organizations. Practically the only new development was the organization early in 1928 of the Amalgamated Securities Corporation, by the Amalgamated Clothing Workers, for the purpose of making second mortgage loans on properties the first mortgage of which is held by the Chicago bank of the union.

Labor banks have declined in number from 33 on June 30, 1927, to 28 on the same date of 1928, the five having passed into the hands of other than labor groups. The resources of these 28 remaining banks showed an increase from 1926 to 1928 of some $5,000,000. On June 30, 1928, their resources aggregated nearly $115,000,000 and their surplus and individual profits more than $3,500,000.

Trade-union credit organizations have been increasing at a remarkable rate. The first of these labor credit unions was formed as far back as 1915, but the idea took hold very slowly at first. Up to 1923 very few such organizations had been formed. Credit unions have been formed rapidly during the past two or three years, especially among the postal employees and railway clerks. In April, 1928, there were some 150 credit unions among labor groups.

MISCELLANEOUS DEVELOPMENTS

Other incidents in the trade-union world during 1927-28 were the holding of the fifth Pan American Labor Congress in July, 1927; the establishment of research or statistical departments for the collection of data to aid in collective bargaining by the Brotherhood of Railway Clerks and the International Printing Pressmen and Assistants' Union; and the inauguration of an unemployment statistics service by the American Federation of Labor through which the trade-union world is kept informed from month to month as to the extent of unemployment of organized workers.

LABOR IN POLITICS

By Lindley D. Clark

United States Employees' Compensation Commission

AMERICAN FEDERATION OF LABOR

It will probably be generally admitted that the closest approach to a mouthpiece for labor is to be found in the American Federation of Labor, despite the non-adherence and even the hostility of considerable groups of workers. The significance of the action of the Federation's Executive Council at its meeting in August, 1928, in deciding not to indorse either of the leading party candidates, is doubtless to be taken at face value, but it in no way operated to prevent either individual members or federated organizations from making political declarations of their own. Of course, no purpose was indicated to discourage the support of "friendly" or "progressive" candidates, whether of one party or another; and the indorsement of such candidates was frequent in the camp and by labor press and State Federations, while prominent officials of various unions engaged actively in campaigning for the success of whichever party they chose to espouse.

OTHER LABOR BODIES

The important Brotherhood of Locomotive Firemen and Enginemen at its convention in San Francisco named various Senatorial, Congressional and other candidates of different political affiliations for support. The same was true of the meeting of the chief executives of twenty-two standard railroad labor organizations at Washington on August 3. The Minnesota State Federation indorsed Senator Shipstead. Governor Smith was indorsed for the Presidency by the New York State Federation in what the Associated Press reported as "a stormy session." The Indiana Federation supported Secretary Hoover in the presidential primaries as against Senator Watson of that State. In other words, while the national Federation avoided taking sides, affiliated groups exercised varying judgments in the matter.

The policy of the Federation is maintained, according to its declaration, because it "has found from experience that the best interests of its entire membership have been protected and conserved through a strict adherence to a nonpartisan political policy," which "requires that the platforms of all the political parties must be compared, and the records of candidates for offices must be carefully studied and scrutinized."

EFFECT ON LABOR POSITION

Over against this stands the protest of the Socialist candidate for the presidency. He said that "what has not been done under this program shows its tragic inadequacy. Under a program of rewarding its friends and punishing its enemies in the old parties, labor has sold its birthright without even getting a good mess of pottage. It has lost its power for straight thinking; it has not formulated a courageous program of demands, and in the end it has not got the little price asked." Prior to the election of November 6, the effects of such policy of indorsement of candidates could be gathered only from the results of primaries. Without attempting the difficult if not impossible task of a complete review, it may be noted that a Texas Senator who had Labor's indorsement was defeated, but by an opponent rated as "acceptable" after the nomination showed his success; while the same history could be told about various candidates for the lower House, though noteworthy incidents of defeat of objectionable candidates are also to be found.

Perhaps it is in only a relatively few cases that the issue of the labor attitude of the candidate can be called detreminative. The appeal that seems effective in the case of a group of what may perhaps be classed as

"intellectuals" to support the Socialist candidate for the purpose of developing a party that will be more truly representative of the interests of the producers, whether by hand or brain, seems to lack cogency at least as far as concerns the membership of the Federation; while the Communist party is anathema, its members being barred as delegates to Federation conventions. A significant step was taken in this same direction when the Executive Council put the ban of the Federation on further support and patronage for the Brookwood College, Katonah, N. Y., as being communistic in its teachings and therefore objectionable to the Federation.

PARTISAN ACTIVITIES

The fact remains that, despite the attitude of the Federation, four political parties designated nominees for the presidency, making their principal appeal for support on grounds of industrial and economic departures from the positions accepted by the dominant parties. There were the Socialist, Socialist Labor, Workers (Communist) and Farmer-Labor Party, each presenting an economic program, more or less radical according to the viewpoint of the reader. All emphasized the necessity of greater power for the producer in regard to the conduct of public affairs and the control of industry. The very number of these divisions in the elements critical of the *status quo* is suggestive of their present inability to produce the changes desired by any group. Whether elimination or consolidation will be achieved and a true Labor party formed as in Great Britain is a question for a prophet and not for a chronicler, though some measure of suggestion may be given by the results of this year's elections.

ELECTION RESULTS

The Senate.—Accepting a summary offered by a labor news agency of even date, it would appear that of 32 candidates for the Senate, 22 had the indorsement of labor. Various reasons prevented indorsements in the cases of the other ten candidates. Of the 22 indorsed, 18 were elected, although, of course, it would require a detailed —perhaps impossible—analysis to determine to what extent labor's indorsement was effective. However, some candidates not in favor with the party leaders were chosen; and in any case, there is a pardonable satisfaction to be found in the actual success of so large a percentage of those believed to be favorable to the interests represented.

House of Representatives.—The record as to Representatives in Congress is not complete at the date of this summary, but indicates that in slightly above 200 of the 435 Congressional Districts a choice was made by indorsement, and that practically three-fourths of the candidates thus favored were elected. The total result is said to be the election of a Congress increasingly favorable to what the dispatch refers to as the progressive attitude toward a type of legislation in line with the desires of the working man.

LABOR LEGISLATION

By Irene Osgood Andrews

Associate Secretary, American Association for Labor Legislation

WORKMEN'S COMPENSATION

The Philippines.—In the field of workmen's accident compensation, important gains occurred in several states. In the Philippines, for the first time, a fairly liberal law was enacted following the main lines of our state laws. It includes compensation for occupational disease, provision for all necessary medical care and provides sixty per cent of wages for 208 weeks for total disability. Insurance by the employer is, however, unfortunately still optional.

In the District of Columbia, the Federal Longshoremen's and Harbor Workers' Act was made to apply to all private employees in the District (see AMERICAN YEAR BOOK for 1927, page 482) except seamen, interstate commerce employees, and those engaged in agriculture, domestic service and casual employments. Important provisions include a seven-day waiting period, all necessary medical care, the compensation of all occupational diseases, a two-thirds wage scale, a $25 weekly maximum with a limit of $7,500 on total amount. The act is administered by the United States Employees' Compensation Commission.

Amendments.—Among other amendments in New Jersey, the weekly maximum compensation was raised from $17 to $20 and the minimum from $8 to $10. In New York, several amendments were enacted including compulsory coverage where four or more workmen are employed, even though the work is not carried on for pecuniary gain; occupational disease when due to "direct contact with" as well as when "involving the use of" poisonous substances; and a number of provisions which aid in the better administration of the act. Porto Rico repealed her old law, and reënacted a new one containing many features of the former law and incorporating several new provisions relating to insurance. Other amendments, largely administrative, were enacted in Rhode Island, Texas, Vermont, Virginia and in Congress for the longshoremen's law.

OCCUPATIONAL ENACTMENTS

Vocational Rehabilitation.—No new laws were passed providing for vocational rehabilitation, but in three Southern states additional help for the blind was provided for and in New Jersey physically "handicapped persons" were redefined to cover anyone incapacitated for normal education.

Old Age Pensions.—In eleven states and Porto Rico, the existing pension laws for civil servants were amended. Rhode Island created a commission to study pension laws for all aged persons; New York continued her commission on this subject, and Massachusetts provided for a public bequest fund which, when the principal amounts to $500,000, may be distributed to needy and worthy citizens, sixty or over, if women, and sixty-five or over, if men.

Mothers' Aid.—Texas has finally accepted the provisions of the Sheppard-Towner Maternity Act leaving only Massachusetts, Connecticut and Illinois still refusing to coöperate with the Federal Government. Amendments in three or four other states relate to mothers' pensions, group life insurance, and pensions for prison employees accidentally injured. Congress extended sick leave with pay for postal service employees to six months instead of thirty days.

Wage Payments.—Safeguarding the payment of wages and teachers' salaries was the subject of legislation in a few states, while mechanics' liens and wage preference laws were strengthened in others. In the Federal postal service, ten per cent must be added to the hourly pay for work done between 6 P.M. and 6 A.M. and salaries for certain other employees were raised.

WOMAN AND CHILD LABOR

But little legislation affecting hours of labor was enacted. In New York, however, women pharmacists over sixteen were exempted from the hour regulations, and in Rhode Island children under sixteen may not work after 7 P.M. instead of 8 P.M. as before, and may work in industrial establishments not more than forty-eight hours a week or nine a day. Important legislation in New York affecting the safety and health of children includes a still further limitation of places of employment for children under fourteen, stricter regulation in regard to the use of badges in street trades, and the prohibition of the employment of boys under seventeen between 7 P.M. and 6 A.M. The work of girls is forbidden by previous laws. In Rhode Island, where the work of boys under twelve and girls under sixteen is forbidden in street trades, the prohibition is

extended to cities of over forty thousand instead of seventy thousand inhabitants. For the District of Columbia, a detailed law with high standards was enacted which includes the exclusion of children under fourteen from gainful occupation, the limitation of hours of minors under eighteen to eight a day or forty-eight a week and six days a week, the prohibition of girls under eighteen and boys under sixteen from work between 7 P.M. and 7 A.M. and boys between sixteen and eighteen from work between 10 P.M. and 6 A.M.

EMPLOYMENT AGENCIES AND INVESTIGATIONS

An important amendment to the law for the regulation of private fee-charging employment agencies was enacted in New Jersey which requires applicants for licenses to conduct an agency to show proof: (1) of good moral character and citizenship in the United States; (2) of suitable premises; and (3) of the public need for the establishment of additional agencies. Both Georgia and Louisiana placed high annual license fees upon agencies which operate to send employees outside the state ($1,000 in Georgia) or who do not have regular offices ($500 in Louisiana). Two investigations of unemployment were authorized by Congress, one by the Secretary of Labor as to the possibility of making periodic reports and gathering permanent statistics on unemployment; the other, by the Senate Committee on Labor and Education, is an investigation into the causes and relief of unemployment.

SAFETY AND HEALTH

Safety provisions in factories, workshops and mines were strengthened in a half dozen states. A specified type of exhaust system for emery wheels, and polishing and grinding machinery must be used in Kentucky; the requirement for dispensaries, and emergency rooms for accidents was extended to docks and to establishments in the urban zone in Porto Rico; and additional safety provisions and competent engineers on hoisting machinery were required in Kentucky mines. In Congress, the Senate Committee on Interstate Commerce was directed to investigate conditions in the coal fields fo Pennsylvania, West Virginia, and Ohio, with special attention to the use of the injunction, evictions and the abrogation of wage contracts.

ADMINISTRATION

In several states, appropriations and salaries for the administration of labor laws were increased, stricter accounting of money expended was required, and in Texas five instead of three deputies were authorized for the Bureau of Labor Statistics. In Kentucky, the Child Welfare Commission was changed to a Children's Bureau with appropriations of $5,000 yearly for the first two years, and authority to establish County Mothers' Aid funds. In New York, the Industrial Survey Commission was continued with a further appropriation of $30,000. An increase of $100,000 was added to the budget of the Federal Bureau of Labor Statistics, an important increase.

EMPLOYMENT

By John B. Andrews

Secretary, American Association for Labor Legislation

FACTORY EMPLOYMENT

The Federal Reserve Board index of factory employment throughout the United States for the first nine months of 1928 averaged three points lower than the monthly average for the entire year 1927. It was seven points lower than the monthly average for 1926; six points lower than the monthly average for 1925 and 1924; and fifteen points lower than the monthly average for 1923. But the 1928 average for the first nine months was ten points higher than the aver-

age for 1921, which was a year of general depression.

United States Bureau of Labor Statistics index for emplyoment in manufacturing industries also shows an average for the first nine months of 1928 three points below the average for 1927, with a gradual decline for 1923, which is the base year. The index of employment in class I steam railways in the United States shows an average for the first eight months of 1928 which is five points below the monthly average for the whole year 1927, and eleven points below 1923, the base year.

PRODUCTION IN RELATION TO EMPLOYMENT

Record Year.—At the same time that the factory employment indices have shown a gradual decrease during the last five years industrial production has been constantly increasing. Accompanying the drop in the Federal Reserve Board employment index of fifteen points from 1923 to 1928 is a rise in industrial production of 9 points (1928 figures based on average for the first 9 months). The employment index for 1928 (based on average for the first 9 months) was lower than any year on record except 1921 while industrial production in 1928 (based on the average for the first 9 months) reached a point higher than any year on record.

Recovery from 1927 Depression.—In the first part of 1928 the country was still suffering from a temporary depression which was most noticeable in November and December, 1927. During those two months industrial production (as revealed by the Federal Reserve Board index) was as low as 99, which was seven points below the average monthly figure for the year 1927. Production began to pick up in January, 1928, by a rise of seven points, yet in January the Federal Reserve Board's factory employment index reached the lowest point in the year. Increases in factory employment in the spring and summer, however, were unusually large as compared with seasonal increases in previous years.

More Goods, Fewer Workers.—The phenomena of steadily increasing production with constantly decreasing employment means that we are able to produce more goods with fewer workers. Whether or not these workers which have been released from industry have been absorbed by expansion in construction, retailing, the professions, personal service, and the various occupations contributing toward automobile maintenance, such as auto repair, gasoline filling stations and what not, is a much debated question.

UNEMPLOYMENT

Shrinkage in Factory Employment.—The cyclical depression in the latter part of 1927 which was still so noticeable in the beginning of 1928 gave rise to the discussion of the extent of unemployment. Social service agencies reported particularly heavy demands, and registrations at public employment offices showed increased ratios of jobs wanted to jobs offered. And finally in response to Senator Wagner's resolution, Secretary of Labor Davis on March 24th made a report which was based on the statement of the U. S. Commissioner of Labor Statistics, Ethelbert Stewart. Commissioner Stewart's statement was concerned only with the *shrinkage* in factory employment from 1925. This he said was 1,874,050.

Unemployment Estimates. — This figure, however, was misquoted to mean that 1,874,050 men were *out of work*. But using this figure for what it actually represented—the shrinkage in employment since 1925—and making allowances for such factors as some unemployment in 1925, increase in population, movement of rural inhabitants to the urban centers, growth in the professions and other occupations, numerous estimates of numbers actually out of work were made. The figure of the Labor Bureau, Incorporated, was 4,000,000. Senator Shipstead's figure was as high as 8,000,000.

Technical Discussion.—It was held by some economists, notably Prof. S. H. Slichter, that not only were we experiencing a period of temporary

cyclical unemployment, but cyclical unemployment was bringing to the foreground a new problem—namely technological unemployment—caused by the tremendous increase in productivity per worker. Others maintained that the problem was merely temporary—that the workers released by the introduction of labor saving devices were shifting to new occupations. This discussion put new emphasis on the inadequacy of our employment statistics. All estimates were actually based on little or no factual material. It is impossible to know what has recently happened to released industrial workers until the taking of the Census of 1930. And we have no comprehensive means for measuring unemployment.

Want of Adequate Statistics.—Not only have we no employment statistics for these other occupations but the employment indices which we use most frequently are glaringly and admittedly inadequate. As pointed out by W. Berridge in the *American Journal of Sociology*, July, 1928, the only adequate information we have is in regard to employees on steam railways which is made available by the Interstate Commerce Commission. This information includes number of employees, number of man-hours worked and the aggregate amount of remuneration received by them. For factory employment which is many times as important as steam railway employment we have information only on numbers of employees on the payroll and the amount of remuneration received by them. Information in regard to building and other trades is gathered by several state bureaus but this is insufficient to reflect nation-wide changes.

LABOR MEDIATION, STRIKES AND LOCKOUTS

By Ethelbert Stewart

United States Commissioner of Labor Statistics

MEDIATION AND ARBITRATION AGENCIES

National and State Boards.—The two most prominent agencies of mediation and arbitration in the United States are the Conciliation Service of the Federal Department of Labor and the Railroad Mediation Board acting under the Railroad Labor Act of 1926. However, other agencies of a less national character are doing effective work, notably state boards of conciliation, and boards created by agreement of employers and employees in certain industries.

Federal Conciliation Service.—In important cases the Conciliation Service of the Department of Labor occasionally acts on its own initiative; but in general its practice is not to intervene in disputes except on the request of one of the parties thereto. The work of the Service during the year has been along lines already established by successful trial. The conciliators are without authority. They exercise their knowledge of human nature in the industrial field gained from past experience. After the parties consent to a conference the discussion that follows generally leads to a settlement in which the conciliators often take a part, by suggesting ways and means found to have been successful in other cases. In seven-eighths of the cases handled the conciliator has been able to secure amicable settlement almost immediately. Because of the hard feeling resulting from a strike, whether won or not, the Conciliation Service makes an effort to harmonize differences and adjust grievances before they reach the breaking point. During the past year from 25 to 50 per cent of the cases handled by the board have been of this character.

Railroad Mediation Board.—In addition to the conciliation work performed by the Department of Labor, the Federal Government through the Railroad Mediation Board does similar work in the transportation industry. The board has continued its

work through the year, practicing mediation where possible and, where not effective, suggesting the formation of a special arbitration board created to hear the case, parties to the dispute agreeing in advance to abide by its decision. Each side appoints one or more persons to represent it; if they are unable to agree upon a neutral arbitrator such person is appointed by the board of mediation. This method has been very successful in settling difficult questions and no strike against the decisions has taken place.

RAILROAD WAGE DISPUTES

Western Locomotive Firemen.—The demand of the locomotive firemen on various western roads for an increase in wages led to the appointment of a board of arbitration which agreed to reach a decision by December 20, 1927. On December 5 it issued a statement that it was unable to agree upon an award. At the suggestion of the United States Board of Mediation the chairman of the board of arbitration called the members together to make another effort to reach a decision. The members appointed by the carrier declined to attend. The remaining members met, and, a majority of the board, rendered a decision December 17, awarding an increase to the men. The carriers refused to obey the award and some of them filed a petition in the U. S. District Court to impeach the award. On the denial of the petition, the case was taken to the Circuit Court of Appeals which on May 24, 1928, affirmed the action of the lower court, thus leaving the award in legal effect.

Emergency Boards.—The Railroad Labor Act of 1926 also permits the president to appoint an emergency board to investigate controversies incapable of settlement and threatening to interrupt interstate commerce. Under this provision, President Coolidge has acted twice. The first finding was in regard to a controversy between the Kansas City, Mexico & Orient Railroad and its engineers, firemen, conductors, and trainmen. The board reported in May, 1928, recommending that because of the financial condition of the road the men accept the increase offered or submit the question to arbitration; the carrier to become a member of the southwestern board of adjustment and there settle other grievances of the men.

The second emergency board, dealing with a controversy involving trainmen on the western railroads, considered the question of a wage increase and the changing of several rules governing the application of the wage scale. Its report, October 30, 1928, suggested that the conductors and trainmen accept a 6½ per cent increase in wages with the present form of contract or a 7½ per cent increase with certain alteration of the rules.

MEDIATION WORK BY THE STATES

The work of the Federal Government to preserve industrial peace is supplemented by the efforts of several industrial states. New York maintains a division of mediation and arbitration in the State Department of Labor, and Massachusetts has established a board of conciliation and arbitration. Both investigate labor disturbances and offer their services as conciliators in the more important industrial controversies. In most cases, however, they act only on a request for aid and use their good offices to bring the controversy to a close. Because of past experience each board is often able by advice and suggestion to aid the parties in reaching an understanding before the difficulty becomes acute. The number of mediatory cases is diminishing, since the boards are called on to interpret preceding agreements and to give advice and assistance in the preparation and drafting of agreements to the end that strikes may be prevented. In other states where conciliatory plans have been provided for by statute, very little has been done because of lack of sufficient appropriation.

PRIVATE MEDIATION AGENCIES

Cases settled through the mediation of bodies other than the conciliation

boards organized under state laws are undoubtedly many. They are rarely recorded. Chambers of commerce, ministerial bodies, and other groups frequently act as conciliators and avert strikes while the tangles in many strikes have begun to be unraveled through the instrumentality of some individual sufficiently interested in the parties in dispute to offer his services to aid in bringing the parties together. Such cases are occasionally recorded but not in sufficient numbers to be statistically considered.

ARBITRATION AND INVESTIGATION

Compulsory Investigation. — The Canadian Act of 1907 providing for the compulsory investigation of industrial disputes before a strike may legally be called or a lockout declared, was used as a basis for a statute in Colorado in 1915 creating an industrial commission of three, one representing labor, one, the employer, and one, the public, to hear cases brought by aggrieved parties, or on the initiation of the commission: and within 30 days to render an award which, however, neither party is bound to observe. The success of this act is debatable, though the commission has heard many cases and has undoubtedly prevented several stoppages from work. In the main, the decisions and recommendations of the board have been respected and followed. In addition, the board has acted in a conciliatory capacity and caused many conferences to be called between the parties, which have gone a great way towards making for industrial peace.

Voluntary Arbitration.—The mediators in the several states having boards of such persons often act as arbitrators. In Massachusetts by agreement all disputes in the boot and shoe industry are referred to the state board for consideration. In addition, many industrial arbitrations are made as the result of an agreement between the parties. The number of such individual arbitrations is not known, because it is not customary to print them or even to announce them publicly.

Chicago Street Railway Case.—It is customary among the street railways and in the printing trades to refer to arbitration all disputes that cannot be settled by the parties interested. Several such cases were thus disposed of during the year. One of the larger ones was the case of 21,000 employees of the street railway companies of Chicago, which was settled by an award of arbitrators, January 21, 1928, increasing the wages of the employees and adding those provisions relative to health and accident insurance.

Railroad Adjustment Boards.—Of a similar character are the boards of adjustment maintained by the railroads and their employees to consider disputes growing out of the agreement. They consist of an equal number of persons from each side and the cases relate mainly to questions of seniority and claims for additional compensation. These boards were first created during the war and because of their usefulness have been continued. Four train service boards are in existence covering the engineers, firemen, conductors, and trainmen in the eastern, southeastern, western, and southwestern districts, respectively. In addition boards exist for the operating department of the New York, New Haven & Hartford Railroad, the maintenance of way firemen on the Union Pacific Railroad, the mechanical department of the New York, Chicago & St. Louis Railway, the employees of the American Railway Express Co., and others.

STRIKES AND LOCKOUTS

Statistics of Disputes.—The United States Bureau of Labor Statistics has been publishing statistics of industrial disputes since 1916, and they show the number of disputes in the United States for the past few years has been diminishing. Thus, in 1927 the number of disputes in which the number of persons involved was reported was only 734 with 349,434 persons affected,—a smaller number than in any year since 1916. Preliminary reports for the first 8 months of 1928 indicate a still further decline, only 390 disputes as

compared with 572 in the first 8 months of 1927.

NEW BEDFORD STRIKE

A general strike began April 16, 1928, of cotton textile operatives in New Bedford following an announcement on April 9, of the cotton manufacturers (represented by the New Bedford Cotton Manufacturers' Association), that a general wage reduction of 10 per cent would become effective April 16. The New Bedford Textile Council, composed of representatives of the seven local textile unions, affiliated with the American Federation of Textile Operatives, opposed the wage reduction and directed the locals to ballot on the question of striking in protest, there being about 8,000 accredited members of the locals affiliated with the council. The vote was overwhelmingly in favor of striking.

This proved to be one of the largest and longest strikes the textile industry has ever faced, involving as it did 26 plants and approximately 25,000 workers of both sexes. An unusual feature of the strike was the fact that only about one-third of the strikers was organized. After the strike began the local unions involved voted to amalgamate with the United Textile Workers, which is affiliated with the American Federation of Labor. On October 6 the unions voted to accept a compromise proposal suggested by the local citizens' mediation committee and the State Board of Conciliation and Arbitration providing for a 5 per cent wage cut, coupled with the assurance that in the future 30 days' notice of any wage change would be given the operatives. By October 10 all the mills had resumed but one.

BITUMINOUS COAL STRIKE

A suspension of mining, involving directly about 190,000 workers, began April 1, 1927, and affected more or less severely mining operations in Illinois, Pennsylvania, Ohio, Indiana, Arkansas, Kansas, Oklahoma, Missouri, Iowa, and West Virginia. (See AMERICAN YEAR BOOK for 1927.) As the miners and operators in Illinois and the other states where mining operations had been resumed in October, 1927, under temporary settlements, were unable to reach agreements to be effective on April 1, 1928, a suspension again resulted in these states on that date, involving approximately 100,000 miners, most of whom were in Illinois and Indiana.

By April 10, 1928, according to press reports, most of the coal operators in Indiana had signed the "Jacksonville wage agreement" with the United Mine Workers, reopenings being dependent on the demand for coal, and that by the end of April the strike in Indiana was technically over, although many of the mines were not operating. Likewise reports from union sources were to the effect that the strike in Illinois was practically over by the end of April, all the large operators having signed separate agreements to pay the Jacksonville scale.

Production of coal lagged, however, as in Indiana, and the situation was so unsatisfactory that the international president of the United Mine Workers of America sent out a call for a meeting of the international executive board in Indianapolis on July 10 and a meeting of the policy committee on July 11, for the purpose of reviewing the strike situation in the various bituminous coal fields and to consider proposed Federal legislation dealing with the bituminous industry. Following these conferences the United Mine Workers on July 18 abandoned their demand for the Jacksonville scale as a basis for wage negotiations in the bituminous coal fields and extended to each of its districts the right to effect settlements with coal operators "upon a basis mutually satisfactory." Conferences were held between operators and union officials in several of the affected states.

Agreements.—In Ohio an agreement applying to about 3,000 miners was effected on August 23 with the Central Ohio Coal Operators' Association, on the basis of $5 per day and 70 cents per ton for cutting and loading. This agreement dates from September 1, 1928, and terminates

March 31, 1930, but covers only a small proportion of the miners of that state. A wage agreement, based, it is said, on the 1917 scale was consummated on August 24 at Kansas City between mine workers' representatives and officials of the Southwestern Coal Operators' Association, effective from September 1, 1928, to April 1, 1931.

A new wage agreement for Illinois has also been entered into, effective from September 16, 1928, to March 31, 1932, which provides for a basic scale of 91 cents a ton for tonnage workers and $6.10 per day for day workers as compared with the old Jacksonville scale of $1.08 and $7.50 respectively. In Iowa a wage scale based on a minimum daily wage of $5.80 was reached on September 28, 1928, subject to the formality of a referendum vote. This scale is said to be a reduction of 14 per cent from the old Jacksonville scale. With the settlement in Iowa the suspension of April 1, 1928, terminated, at least theoretically.

WORKMEN'S COMPENSATION AND INSURANCE

By John B. Andrews

Secretary, American Association for Labor Legislation

LEGISLATION

General.—During the year 1928 the Federal Congress and the legislatures of nine states and Porto Rico held regular sessions. The most significant advances made were in the field of workmen's compensation. Progress may also be reported in old age pension legislation and group insurance.

The most important legislation to be enacted was that by Congress in extending the provisions of the Federal Longshoremen's and Harbor Workers' Compensation Act to private employees in the District of Columbia. With compensation protection thus established in the District, only five states—Arkansas, Florida, Mississippi, North Carolina and South Carolina—remain without this modern remedy for industrial accidents. Congress also acted promptly to remedy a rather serious condition which arose in the administration of the Longshoremen's Act through the refusal of the Attorney General to authorize Federal district attorneys to represent the Commission in court actions. An amendment to the law was accordingly passed, making it the duty of the district attorneys to appear for deputy commissioners and the Commission. A fairly liberal workmen's compensation act, adopted by the Philippine legislature in 1927, went into effect on June 10, 1928. Seven state legislatures and Porto Rico passed more or less important amendments to the compensation acts, and the pension laws for civil servants were amended in several states.

District of Columbia.—Congress has long neglected private employees in the District of Columbia. Heretofore, they have not even been protected by an employers' liability act. Now they are entitled to the benefits provided by the Federal Longshoremen's Act of 1927. Congress extended this Act to apply to all private employees in the District except seamen, railway employees in interstate commerce, and employees in agriculture, domestic service and casual employments. Important provisions include a seven-day waiting period, all necessary medical care, compensation for all occupational diseases, a two-thirds wage scale, a $25 weekly maximum with a limit of $7500 on total amount. Modern provision is made for accident prevention and coöperation in rehabilitating disabled workmen. The Act is administered by the U. S. Employees' Compensation Commission with a deputy commissioner in charge of the District. It is officially estimated that 120,000 workers are covered while certificates of compliance have been issued to nearly 12,000 employers. Official reports indicate

that approximately 1200 accidents occur monthly.

The Philippines.—The new workmen's compensation act follows closely the principal provisions of our state laws. Public and private employees are covered with the customary exemptions. Provision is made for all-inclusive occupational disease compensation and for all necessary medical care. In case of total disability, 60 per cent of weekly wages is paid after a seven-day waiting period; for partial disability, the scale is 50 per cent of wages, payments to date with the first day's disability. The percentage of wages to be paid in case of death varies from 45 per cent to 60 per cent according to the number of dependents. There is no commission created to administer the law, but compensation agreements must be acknowledged and witnessed by certain designated officials including the director of the Bureau of Labor. Another inadequacy in the law is its failure to require the employer to insure the payment of compensation.

State Laws Amended.—Of the eight jurisdictions which amended the workmen's compensation laws, the most important changes were made by Porto Rico, New York and New Jersey. In Louisiana, the Hernia provision was eliminated and compensation payments in case of death were specifically limited to 300 weeks. An amendment which would permit the injured employee to elect, after the injury, either to sue for damages or accept compensation was withdrawn by the governor when it became apparent that agreement could not be reached on the proposed measure. The Massachusetts law was slightly amended to increase the amount of compensation payable for the loss of certain specific members. In Rhode Island, the Commissioner of Labor is empowered to decide the merits of a controversial case in the first instance, instead of the superior court. Virginia extended control over insurance carriers and rates with authority vested in the State Corporation Commission instead of the insurance commissioner. A commission of six was created in Kentucky to investigate the existing workmen's compensation law and to report its findings and recommendations to the 1930 General Assembly. Members are to receive expenses but otherwise to serve without pay.

Porto Rico.—The compensation law was repealed and reenacted. The most important change made was to grant to employers the option of insuring with the Porto Rico Mutual Insurance Association, the organization of which is provided for in a separate new act. This feature was apparently adopted with the argument that this is the form of compensation insurance in Massachusetts which has been approved in practice. But the Bay State Commonwealth abandoned its Employees' Insurance Association many years ago. The state fund is continued under the control of the superintendent of insurance with the treasurer of Porto Rico as custodian.

New Jersey.—New Jersey may be credited with taking the most important forward step in 1928 toward providing more nearly adequate benefits. The new amendment raises the weekly maximum from $17 to $20. It also increases the weekly minimum to $10—the highest amount fixed in any state—and in addition provides more substantial benefits for the loss of an arm, a hand, a thumb and a forefinger. Fifteen American compensation laws now provide a weekly maximum of $20 or more. Other minor changes include the requirement that the employer must furnish artificial limbs or appliances in certain cases.

New York.—The compensation law was extended to cover employments not carried on for pecuniary gain (heretofore excluded), in which there are engaged four or more workmen. This numerical exemption continues to apply likewise to other employments covered by the act. The occupational disease section was broadened by providing that compensation be paid for disability or death caused "by direct contact with" any of the poisonous substances listed in the law. Formerly, compensation for occupational disease was allowed only if contracted in a process involving the

use of any one of the limited number of poisons specified. Although this amendment provides adidtional coverage, wage-earners in the state will not be adequately protected against the hazards due to the increasing use of industrial poisons until an all-inclusive occupational disease provision is enacted. Ten laws, including the three Federal acts, make this necessary provision. Other amendments include regulations restricting the appearance before the industrial board of representatives of claimants and representatives of self-insurers, a section empowering the state fund to insure employers under the Federal Longshoremen's Act and a provision making it a misdemeanor for any physician in the employ of the Department of Labor to treat a compensation claimant.

REHABILITATION

State Enactments. — Louisiana created a state board for the blind to act as a bureau of information and industrial aid, to provide vocational training, and to establish workshops. An appropriation of $75,000 was made for the year ending June 30, 1929, and $7,500 for the year ending June 30, 1930. Mississippi likewise made provision for assisting the blind by creating a state commission to aid those not otherwise provided for in finding employment, and marketing their products—the commission to report annually to the legislature. New Jersey broadened her rehabilitation act of 1919 to include within the term "physically handicapped" any person, instead of only those over sixteen years of age, incapacitated for education as well as for remunerative occupation. The Commissioner of the Department of Institutions and Agencies, instead of the Commissioner of Charities and Correction, and five other members instead of three, are to serve on the state Rehabilitation Commission. Of the two additional members, one must be a woman with a specialized knowledge of the problem of crippled children.

Federal Action.—The United States House of Representatives passed a bill to provide for the vocational rehabilitation of disabled residents of the District of Columbia, along the lines of Federal-state coöperation already accepted by forty-one states. On the Senate side, however, the bill was not reported out of committee. Two bills were also introduced in the Federal Congress for the purpose of securing more complete development of vocational education in the states. The Senate bill passed and was sent to the House where it was reported on but did not come to a vote.

OLD AGE PENSIONS

Investigating Commissions. — Increasing attention to the need for aid to the indigent continues to be manifested. A resolution was introduced in Congress to provide for an investigation of old age dependency in the United States and methods of relief. Bills providing for old age pensions in cooperation with the states were also introduced. New York continued its joint legislative committee for the study of the aged poor—created in 1926—and with a doubled appropriation. In Rhode Island, the state Commissioner of Finance was directed to investigate the general subject of old age pensions and the various state old age pension systems with a view to their practical adaptability in Rhode Island; he must report to the General Assembly by January 15, 1929. In Mississippi an unpaid commission was directed to make a study of teacher retirement legislation, and make a report, together with recommendations, to the legislature convening in 1930.

State Enactments.—Massachusetts has provided for the establishment of a public bequest fund to consist of voluntary contributions and gifts and controlled by a commission of three existing state officials. When the fund's principal amounts to $500,000, the commission, with the approval of the Governor and the Council, may distribute the fund's income to needy and worthy women citizens sixty years of age and over, and to men citizens sixty-five and over. The state retirement law was amended, the principal change being the revision

of the provision dealing with retirement for permanent disability. Kentucky established a state teachers' retirement system which is administered by the State Board of Education. The fund is composed of money appropriated by the state with 2½ per cent of members' salaries and an equal contribution by employers. Members who attain the age of sixty may be retired on an allowance equal to accumulated contributions in their behalf, and disabled members may be retired after five years of service on three-fourths of this annuity. Porto Rico created a pension fund, administered by a board of five, for members of the insular and municipal departments of education and charity schools. Amendments were adopted in Kentucky and New Jersey to the pension fund law for firemen and policemen, and New York extended the state employees' retirement and pension system.

Six states—Montana and Nevada (in 1923), Wisconsin (1925), Kentucky (1926), Colorado and Maryland (1927)—and the territory of Alaska have already adopted straight old age pension laws, based on the "standard bill." This proposal provides that a citizen of 70 years or upward who has also resided continuously 15 years in the state shall, if the value of the applicant's property does not exceed $3,000, be entitled to a pension which, when added to other income, shall not exceed a total of one dollar per day. A state-county system of administration is provided on an economical basis with provision for careful local investigation and general supervision. Under the Montana law, 693 persons in 41 of the 56 counties received pensions amounting in the aggregate to $115,400 during the calendar year 1927. The Wisconsin law has been accepted by six counties.

Legislation enacted in 1927, not previously reported, includes the adoption by Alabama of a firemen's pension and relief fund, municipal employees' pension and relief funds in certain cities, and a teachers' retirement law for cities of 100,000 population or over. Georgia also established retirement and pension funds for civil employees.

Other social insurance legislation to be noted is the acceptance by Texas (in 1927) of the provisions of the Sheppard-Towner Maternity Act to be administered by the State Board of Child Health through its Bureau of Child Hygiene cooperating with the Federal Children's Bureau; and the enacting by New Jersey and the amending by Massachusetts of the law authorizing group life insurance for employees.

COGNATE SOCIETIES

American Association for Labor Legislation.—131 E. 23rd St., New York, N. Y.

American Federation of Labor.—A. F. of L. Building, Washington, D. C.

American Federation of Musicians.—1440 Broadway, N. Y. C.

International Association of Garment Manufacturers.—395 Broadway, New York, N. Y.

International Association of Machinists.—799 Broadway, New York, N. Y.

International Longshoreman's Association.—500 W. 30th St., New York, N. Y.

International Seamen's Union of America.—623 So. Wabash Ave., Chicago, Ill.

Industrial Workers of the World.—32 Second Ave., New York City, N. Y.

Junior Order of United American Mechanics.—121 No. Broad St., Philadelphia, Pa.

Labor Defence Council.—108 E. 14th St., New York, N. Y.

League for Industrial Democracy.—70 Fifth Ave., New York, N. Y.

Marine Engineers' Association.—116 Broad St., New York, N. Y.

Masters', Mates' and Pilots' Association.—119 Broad St., New York, N. Y.

National Association of Letter

CARRIERS.—19 Massachusetts Ave., Washington, D. C.

NATIONAL CIVIC FEDERATION.—1 Madison Ave., New York, N. Y.

NEPTUNE ASSOCIATION OF MASTERS AND MATES OF OCEAN AND COASTWISE STEAM VESSELS, INC.—82 Broad St., New York, N. Y.

NATIONAL FEDERATION OF POST OFFICE CLERKS.—American Federation of Labor Bldg., Washington, D. C.

NATIONAL INDUSTRIAL CONFERENCE BOARD.—247 Park Ave., New York, N. Y.

NATIONAL INDUSTRIAL COUNCIL.—50 Church St., New York, N. Y.

DIVISION XVII

RELIGION AND RELIGIOUS ORGANIZATIONS

INTERDENOMINATIONAL CONFERENCES AND ACTIVITIES

By H. K. Carroll

General Statistician of the Churches

MISSIONARY CONFERENCE IN JERUSALEM

Program and Attendance.—This is the successor to the previous great World Missionary Conference in Edinburgh, Scotland, in 1910. Meantime, the world war has brought Jerusalem under the supervision of England and a steadfast government controls the different elements of population and religion. The conference had a program which was long under preparation by a competent committee. The representation was not entirely of missionary societies, but partly of societies and partly of churches, some of the latter having grown up under missionary organization. It was in session two weeks, closing in the Easter season. Notable members sat side by side from China, Japan, India, Africa, South America and other mission fields as well as from the United States, England and other European countries.

Christian Views.—The conference took a broad view, holding that fellowship should be broad enough to include all Christianity, and that recognition of non-Christian cults should embrace their purposes to seek truth under whatever name and in whatever fold. The values of Hinduism, Buddhism, Islamism, Confucianism were considered, but it was held with unshakable assurance that there is in Christ uniqueness and universality which are for the use of the whole world. The message of the conference calls upon the followers of non-Christian religions to join with Christians in the study of the great teacher, his place in the world and his power in human life, and to hold fast to faith in the unseen and eternal and to coöperate against all the evils of secularism.

Discussion.—Social subjects, industrialism and wide human needs were considered in larger measure than in any previous missionary conference. Racial relationships, which is a large question in mission fields, was discussed in a broader light, perhaps, than usual. Declarations were made against war and in favor of the changing of those attitudes and practices which make for war. At the last session on the Mount of Olives, the resident Archbishop of the Orthodox Eastern Church brought his choir from the Orthodox Cathedral to sing selections from their own service.

Jewish Interest.—American Jews and Jews from other lands must have heard some of the utterances of the conference which no doubt were heard from New York that differences among Jews as to the ultimate destiny of Palestine have been abandoned and that it is to be rehabilitated so as to become a spiritual shrine of Zionist and non-Zionist alike. The conference had a word of recommendation for missions to the Jews of the great teacher and habitant of Palestine.

MISSIONARY CONFERENCE IN CONGO AFRICA

Missionary Jubilee.—A missionary conference recently held in the Congo, Africa, at Leopoldville, might well

have been visited by the ghosts of Henry M. Stanley and David Livingstone. The occasion of the meeting this year in a city of 30,000 people, formerly little more than a wild and dangerous section, was in celebration of the missionary jubilee by Americans, British and others. The other name of this populous center is Kinshasa, and the gatherings of many missionaries and others, interested in the welfare of the native population, might well have strained the accommodations of the hotels, houses, tents, etc.

Representation.—Those gathered there were not only Protestant missionaries and workers, but Catholic priests, who have been endeavoring to initiate the natives in the Roman Catholic faith, and also Belgian officials, seeking with a truly humane purpose the moral and civil welfare of savage and civilized natives. The Belgian civil government was a solicitous host to those meeting in various groups, according to the faith and the character of the work.

Economic Advance in Congo.—Missionaries say that a time of industrial, economic and commercial change has come to this black center. Copper, diamonds and other deposits the earth yields have come to the surface out of the covered depths. Steamers trying to serve thousands of travelers who come from one coast or another, intent on their purposes, ply in the river and lakes. More than this, an airplane service has been established, and even the radio so that guests at the hotel on a recent night heard an address by Herbert Hoover at Newark, N. J. Roads are in operation for motor trucks and one can reach almost any remote jungle in a short time. The conferences recently in session formed plans with the cooperation of the Belgian Civil officials for the extension of missionary and educational work. It semes probable that a new day has dawned for Africa.

Significance of Conference.—The Governor General gave both conferences a courteous reception in his mansion. The missionaries show an amazing devotion to the natives here on ground where the slave trade used to flourish. Fifty years ago the few missionaries had to face cannibals and the danger of being devoured, but no perils made them hesitate. The native has come to appreciate missionary work and in return is devoted to the workers. This Congo conference appears to have marked an epoch in the history of missions, especially of African missions.

RELIGIOUS CONFERENCE IN JAPAN

Following the Jerusalem Conference, a unique religious conference was held in Nagano, Japan. It was very broad in its personnel, including Christian, Buddhist and Shintoist leaders. It was proposed by a group of liberal Neo-Shintoists, who secured a committee of preparation numbering about a score. Neither the government nor the foreign missionaries had a part in it. But the idea became popular in a night and several thousand workers applied for membership, but to keep the conference in workable shape only 1,600 delegates were admitted, of whom 550 were Buddhist, 260 Shintoist, 150 Christian and 640 scholars and national leaders. The conference discussed in four groups: World Peace, Social Work, Religious Education, and Religious Thought. Bishop Uzaki of the Japan Methodist Church, who had just returned from the Jerusalem Conference, said that he as a Christian thought "that Christianity should accept what is good in other religions and should have consideration for their respective backgrounds. It is futile for Christians to keep their present attitude of superiority to other religions." He showed the possibility of religions differing in methods and yet coöperating in the improvement and betterment of society.

FEDERAL COUNCIL OF CHURCHES

Organization.—The full name of this organization is Federal Council of the Churches of Christ in America. Associated in it are twenty-eight Christian Churches, including the Protestant Episcopal, whose relation is coöperative, and the United Lutheran, holding a consultative relation.

The General Council, quadrennial, is composed of representatives of the several bodies, appointed by the selective power of each. The Council, held in Rochester, N. Y., in the first half of December, 1928, celebrated the twentieth anniversary of its existence. The twenty-eight churches range in number of members, or communicants, from less than 10,000 to 4,600,000 each, making a total of between 21,000,000 and 22,000,000. There is an Executive Committee, which meets annually, as well as an Administrative Committee which meets monthly.

Scope of Activities.—Since its formation in 1908, the Federal Council has greatly increased its influence and activities, both of which embrace the United States and also coöperatively, other countries in the continents, excepting Australia. In its own country, it represents its constituent churches in matters religious, moral and governmental in various lines of coöperative work such as the selection and welfare of army and navy chaplains, enforcement of laws against the manufacture and use of intoxicants and narcotics and for the prevention of immoralities. It makes representation to the Federal Government by appeals to its legislative bodies and to its officials, and assists religious bodies in other countries in strengthening their efforts in missionary and other lines of endeavor. It has a social service commission to protect labor from oppression and secure its rights. It has also commissions to improve race conditions and coöperates with home and foreign mission societies. Its international friendship and good will societies assist in promoting peace and outlawing war. In short, it lends a helping hand to about everything that is designed to promote the religious, moral, social and educational welfare of mankind. It has taken a position against increase of the naval force of the United States as likely to add to the tendencies to war.

Rochester Meeting.—Reports, covering twenty years, were given at the Rochester meeting, plans for the future were considered and election of officers to serve for the coming four years took place. Rev. Dr. S. Parkes Cadman has served as President during the last four years. His successor for the next term will be Bishop Francis J. McConnell of New York Methodist Area. The Council created the office of Radio Minister and requested Dr. Cadman, who has done so much in that line in New York City, to serve in that capacity. General Secretary Charles S. MacFarland, in his report, stated that the "demons the Council seeks to cast out are social wrong, race prejudice, ignorance and brutal war," and that the two things the church most needs today are "spiritual authority and human sympathy."

Dr. Cadman gave what may be called a closing presidential address on the subject of Protestant Christian Unity, expressing the feeling that "in coöperative service rendered by Christians who surmount interdenominational lines is the secret of future success and the assurance of heaven's guidance." Protestants, knowing that new occasions breed new duties must attempt unification of their forces without injuring the dearly bought freedom they enjoy. How shall authority and liberty be so welded together crushing liberty? This question concerns every great economic advance,—human and divine.

THE NATIONAL CHRISTIAN COUNCIL OF CHINA

The sixth annual meeting of this body was held in Shanghai in October last. The fact that a large organization embracing nearly 100 delegates, and representing a church membership of 300,000 can meet quietly and transact its business shows that war has lost much of its power in the last year in this still distracted and divided country. The delegates came from all parts of the great country, south, west, north. Two-thirds of the Council consists of Chinese members, a Chinaman is President, another is chairman of the Business Committee, and other natives occupy important positions, indicating that this native church is

ready to assume leadership. The conference evidenced little or no discouragement but, on the contrary, was eager and anxious to adopt a new program. It was distinctly a forward-looking conference. It is interesting to know that the Jerusalem Missionary Conference furnished no little of the inspiration of the Shanghai gathering which discussed its findings. One commission outlined the work of the Christian believer and expressed the opinion that a limited number of selected visitors should come to China for periods of from six months to two years to study conditions, analyze problems, evaluate present methods, and give advice and inspiration. Another commission believes the church should strive to create a healthy, constructive public opinion to assist the government and prepare men and women for public service. Another commission presented findings on the subject of training church workers for effective service. The next Council is to be selected by the churches and not by the missions. Speakers showed how much inspiration and enthusiasm they had brought from the Jerusalem Conference.

WORLD SUNDAY SCHOOL CONVENTION IN LOS ANGELES

Every four years, this body including all Protestant Churches holds its great gatherings to discuss reports on the condition of Sunday Schools. The latest one was held in Los Angeles, Cal., in July 1928, meeting in the Shrine Civic Auditorium, which accommodates 7,500 people. The theme of the Convention was "Thy Kingdome Come." All the aspects of the work for children's work, youth and leaders of youth, adult work, and administrative work, were considered, and seven seminar groups of three sessions each studied the technique of religious education. Then there were ten area meetings presenting a cross-section of the Christian program around the world. Dr. W. C. Poole, said, "We must not only gain converts, but establish them in such right relations to one another as to constitute a kingdom." Words of encouragement and information came from Egypt, China, Japan, and other centers of the world. The next convention will be held in Rio de Janeiro. The new President is Sir Harold Mackintosh.

CHURCH AND GOVERNMENT RELATIONS

By H. K. Carroll

General Statistician of the Churches

Mexico and the Roman Catholic Church.—No plan of settlement of the conflict between the Mexican Government and the Roman Catholic Church in Mexico has been arranged. Various outbreaks have occurred, the most serious of which was the killing of Obregon, scheduled to succeed President Calles, as head of the state. The government forces seem to be less aggressive against the Church, though its policy does not appear to have been definitely changed. Perhaps this is due, in some degree, to the cessation of religious work by priests not recognized as citizens of Mexico. President Calles has given place to Provisional President Gil until an election is called and a successor is elected according to the constitution.

Parliament and the Anglican Church.—The matter of the Revised Prayer Book for the Church of England has not yet been definitely settled. The House of Commons has twice refused to approve it. The Church has proceeded after a few changes to pass upon the book a third time; the Bishops and the two Houses of Convocation having voted in favor of it. Next, it comes before the Church Assembly and thereafter whether such of the Churches as like it will proceed to use it either solely, or in con-

nection with the old book, or keep to the old book exclusively, is still one of the things the future must settle. The Bishop of London called the priests in his see and asked them to approve the use of the new book, but they refused so to do. Dean Inge, thereupon, suggested that the bishop should exchange London for another see.

Separation of Church and State in Turkey.—According to a ruling of the Turkish Government, the constitution of that country has been freed, according to definite report, from the last vestige of connection with religion, and a copy of the ruling has been sent to the State Department in Washington. If Turkey has, indeed, been completely secularized, it is the most remarkable event in its history. The change began in 1924 with the abolition of the Caliphate; the Caliph having been head of both church and state, his title meaning "Sword of Islam." An attempt was made to divorce the twin powers, leaving religion to the Caliph and the state to the Sultans, but the secular authorities would not have it so, putting the Caliph and his family out of Constantinople. Then the theological schools were abolished, some sixty of them in number. There had been one in each large mosque in the capital. The Swiss Civil Code was adopted, Roman replaced Arabic letters, and the religious element was removed from the law by erasing the words, "The religion of the state is Moslem." Three American teachers in an American school were tried for violating the law by giving religious instruction to Turkish girls, but they denied that they had answered the questions asked of them in the school. They were found guilty by the judge but the penalties were light in consideration of the fact that they did not intend to break the law of secularization.

Russia and Religion.—There is, it is known, an "All-Russian Evangelical Christian Union" in Russia, notwithstanding the Soviet and its opposition to religion. A picture was published in a well-known New York weekly showing the Council of the Union in session apparently on a sidewalk, and another picture of the Union's theological school in Leningrad at study. There are 140 Evangelical students and 160,000 copies of Bibles, New Testaments and hymn books, and Christian calendars are to be had. Not only is the Evangelical body growing, but the Lutheran Church has been recognized by the state and a new subordinate synod allowed. Soviet authorities, however, have been greatly disturbed recently by reports of the increase in Christian believers and have rushed through a law forbidding open religious libraries and reading rooms and worship in public squares. The *Isvestia*, the Soviet organ, reports that communist clubs have, in some instances, virtually abandoned their anti-religious activity.

PROTESTANT DENOMINATIONAL ACTIVITIES

By H. K. Carroll

General Statistician of the Churches

GENERAL CONVENTION OF THE PROTESTANT EPISCOPAL CHURCH

Washington Cathedral.—This supreme triennial American branch held its bi-cameral sessions in October, 1928, in Washington, near the new cathedral, which is expected to be of the widest possible religious service to the nation. It will cost $30,000,000, including institutions, such as a college for preachers, schools for boys and girls, and other adjuncts. It is called "a power house of the Spirit," in the words of George Wharton Pepper, chairman of the Executive Com-

mittee. Immediate construction requires, it is stated, a fund of $6,500,000, for the custody of which the services of United States Secretary of the Treasury Mellon has been secured.

Prayer Book Revision.—Perhaps the most notable action of the General Convention was the completion of the pending revision of the Book of Common Prayer, upon which favorable action was taken three years ago. The Cranmer language of the sixteenth century, though mellifluous, needed, it was thought, some modification to suit modern English and moderate changes to bring it in accord with modern usage. A new series of Lessons for Sundays, week days and the Christian year and rearrangement of lessons from the Old and New Testaments, respectively, are features which it is believed will make the book more helpful and instructive. The action of the General Convention three years ago, in eliminating the Thirty-nine Articles was recalled and the Articles restored to their place in the Book in response to a wide request.

President's Address.—While the work of legislation was proceeding, many meetings, missionary, philanthropic, educational, were proceeding outside the Convention. One impressive act was taken by the women at early communion one morning when they presented an offering of over $1,100,000 for general church work. The opening service of the Convention was attended for the first time in the history of the Church by the President of the United States, who delivered an address which was a plea for a place for religion in the national life. His address was greeted by warm applause at the end. The preacher of the occasion, Bishop Anderson, speaking carefully on Church and State, although opposing the intrusion of political themes in the pulpit, nevertheless favored a strong courageous presentation "of the whole counsel of God." An announcement peculiarly grateful to the Convention was that the end of the deficit reported in 1925 of more than a million and a half of dollars is in sight. The program of the Church for the next three years calls for $4,350,000 for general church work.

Convention Activities.—The Convention reaffirmed the resolution adopted three years ago welcoming renewed efforts by the government to enforce prohibition and anti-narcotic laws. The Convention went a step or two further than it has gone hitherto and agreed that in addition to the association of its social service commission with the Federal Council of the Churches of Christ in America it may coöperate with the Council in connection with its committee on Evangelism. This was welcomed with great applause. Divorce was dealt with in connection with a careful report of a committee which does not advise relaxation of the Church law —that of Christ—at least at present, but suggests a more careful and scientific consideration as to methods of study which may tend to realize conditions of married life.

Christian Unity Proposal.—What may be regarded as a distinct practical advance on the subject of Christian Unity was taken by the Convention on the motion of Bishop Brent, the Church's accepted leader on this subject, proposing that the two Methodist Churches, North and South, and the two Presbyterian Churches, North and South, should be invited to appoint commissions to sit with a similar commission of the Protestant Episcopal General Convention, "in the consideration of matters of Christian morality looking toward organic unity" and that the Episcopal Convention Commission should consist of three bishops, three ministers and three laymen, and report should be made to the General Convention. The last named commission has not yet been announced, and the two former have not been authorized, except possibly those of the two Methodist bodies.

A pastoral letter was issued by the Bishops which carefully defines the Church as the body of Christ and asserts that Christ is the representative of humanity. " . . . The Church is, therefore, the prophecy of human destiny. It indicates, therefore, the right

relations of men to God and to one another. It is the inner group of all mankind, 'the group that is conscious of the sonship which belongs to all.' Its function is not to draw men out from the human family, but to make that family conscious of its relation to God. The Kingdom for which the Church works and prays comes when men live as brothers in loving obedience to their heavenly father."

ANGLO-CATHOLIC ACTIVITIES

New York Meeting.—These English and American annual meetings aim to stand between Romanism and Protestantism. The American body, which met in New York City in November, heard a long list of papers read aiming to set forth the relation of the Catholics to various articles of the faith, to various duties devolving upon them and to various interests of the Church and humanity. A friendly letter from Presiding Bishop Murray, regretting his inability to attend this year, stated that he had attended two previous meetings with pleasure and profit. The general attitude of the Church in America is one of tolerance toward the Anglo-Catholic body. Bishops Murray and Manning holding, with perhaps most other of their brother prelates, that the Church ought to be comprehensive for its own sake and for the sake of Christianity. Bishops of the United States and Canada attended the Congress and took part in its proceedings.

The Anglican Prayer Book.—After waiting for centuries to prepare and publish a revised prayer book which might be used in conjunction with the old book in which Archbishop Cranmer put some competent and beautiful work, or separately therefor, the Church of England was prevented from any use of the new book by the refusal of the House of Commons, in 1927, to approve it, probably because of the opinion that it yielded too much to the Anglo-Catholic element and seemed to allow those who desire to do so to hold the doctrine of transsubstantiation, which Archbishop Cranmer wanted left out of his book. A second unfavorable vote by the House of Commons on the book after it had been slightly changed, leaves the Church to use the old book unchanged, or to proceed without legal authority to use the new book as it may wish. The convocations and bishops have, with some objection, decided to brave the disfavor of Parliament and perhaps invite disestablishment by going on with the new book. The Church Assembly, which is expected to follow the convocations and the bishops, is yet to take action.

New Primate of the Church of England.—Near the close of the year, Dr. Davidson, having retired from a long term of service as Archbishop of Canterbury, Dr. Cosmo Gordon Lang, Archbishop of York, was appointed to succeed him and was enthroned with impressive ceremonies in Canterbury Cathedral, December 4, 1928. There were present high officials of the government, including the Commission of the Crown. The Dean of Canterbury conducted the ceremonies, including installation of the new incumbent in the chair of St. Augustine, and representatives of the Protestant Episcopal Church, of the Eastern Orthodox Church and of the Greek (Hellenic) Church, were present. Dr. Davidson's retirement was followed by his elevation to the peerage as Baron Davidson of Lambeth.

UNION MOVEMENTS

United Church of Canada.—This body organized by the union of Methodist, Presbyterian and Congregationalist elements in the Dominion of Canada in 1925, has continued in harmonious activity, cementing its bonds of union by increased activities as an organization, not forgetting there is a dissentient group of Presbyterians which, declining to enter the combination, has continued its separate existence, with some accessions since. The criticism that the united body had too large and costly a staff, has been answered by the fact that seven of them have died from the strain of their duties in the last two years. The General Council was held in 1927 in Winnipeg, 450 ministers and laymen having been elected as delegates by presbyteries and conferences. The call of the world to the increase of

evangelistic work seemed to have pre-eminence of attention and the Council gave large attention to reason for facing intellectual and ethical revolt among the younger folk and instructed its boards to more strenuous work to meet the demands in all directions.

Subjects which received full consideration were the evils of war and liquor traffic. The question of ordination of women was thoroughly discussed resulting in the decision that there exists no bar in religion or reason to such ordination, but that it is wisest to wait until the Church has reached a fuller and more settled agreement before taking favorable action. The United Church has now 8806 congregations, 4500 ministers, and 693,000 members, or communicants. As the result of three and a half years' work, six hundred new congregations have been formed and virtually all ordained ministers are employed instead of 270 continuing without pulpits as was the case at the beginning. The anti-merging Presbyterians have 172,518 communicants and 1281 congregations. The merging of the Reformed Episcopal Church and other bodies is under consideration, and the fraternal delegate of the Church of England in Canada stated that there was no real barrier to an eventual broadening of the United Church of Canada so as to bring his church in.

Prospective Union in South India.—A meeting in Bangalore, India, recently, seemed to indicate that a union of the Anglican, English Wesleyan and South India United Church is probable at no distant date. They have been in negotiation with this purpose in view. Beginning with the fact of oneness in Christ they found it would carry them through many theoretical difficulties. Out of this primary purpose as far as possible, the secondary issues might be met, it was argued, after union begins. Thus they agreed upon a constitutional episcopacy, and both Wesleyans and the South India United Church agreed that episcopal ordination would be acceptable. On the other hand the Anglicans agreed that the other two bodies should retain their right of fellowship with those with whom they have been in such relationship. The South India Church consists of Presbyterian, Reformed and Congregational elements. Thus when the union is consummated it will consist of more bodies than the United Church of Canada. A continuation committee of ten was appointed to consider certain matters referred to it and report to another meeting early in 1929.

Union Movements in the United States.—There are several of these: (1) by the Methodist General Conference extended to the Presbyterian Church in the U. S. A. and the Congregationalists; (2) by the Protestant Episcopal General Convention to the two Methodist Churches, North and South, and the two Presbyterian Churches, North and South; (3) three independent Lutheran Synods,—the Ohio, Iowa and Buffalo voting in favor of union; (4) the Norwegian Lutheran Church in America, a union which took place a few years ago; it has voted to drop the word "Norwegian" from its title which may prepare the way for union with other Scandinavian bodies; (5) the Congregational and Christian Connection bodies have agreed upon plans of union in North Carolina and certain other states; (6) unification is still pending between the Methodist Episcopal and the Methodist Episcopal Church, South; (7) union is pending between the Congregational and Universalist Churches.

Union Movements in England.—For not a few years the Methodist bodies in England have had union propositions before them. Several bodies came together some years ago and formed a harmonious body, leaving a number still in separate existence. Union of these bodies—the Wesleyan, the Primitive, the United Free, the Wesleyan Reform, the Independent—has been pending for several years. Votes have been taken which resulted favorably, but it was deemed prudent to take time enough to remove differences. This time seems to have been reached. The chief body, the oldest and largest, has invited

the free churches to a general union which may come in time.

Union Movements in Scotland.—John Knox brought Presbyterianism into Scotland in 1560 and it took form as the Established Church of Scotland, called lovingly the Old Kirk. Various differences from time to time created divisions, the Reformed, came in 1690, the Secession in 1733, the Relief in 1761, the Free in 1843, and then various other bodies, such as the Original Secession, the United Secession, etc., gradually united with one another but not with the "Auld Kirk." The Free joined with another to make the United Free, except a small number of the second named body, which was called the "Wee Free." Disestablishment and disendowment came to the Old Church and with it opportunity for union with the big body. For some years they discussed union and then began to vote. They have taken plenty of time in this process, using the smoothing process when threats of escape of groups came into view, and always the majority has grown in size. The patience exercised with dissentients has been almost divine, the only consolation has been the constant gains. The chief difficulties have arisen in the United Free Church and not in the oldest body. It is the Old Church which will finally achieve the victory for its name will remain and a quasi-relation to the State which will appoint some prominent man to represent it in the ceremony at the annual meeting of the assembly.

THE BAPTIST COMMUNION

The Baptist World Alliance Congress held its latest meeting in Toronto, Canada, in June, 1928. Its next Congress will convene in Berlin, Germany, five years hence. It was to have met there in 1915, but the World War prevented. There are five other communions belonging to Protestantism: the Anglican, given on a preceding page, and embracing the Church of England and those of Scotland and Wales; the Protestant Episcopal Church in the United States and the Church of England in Canada, Australia and other countries. Its last world Conference was held at Lambeth, England, about ten years ago. The Baptist Alliance embraces all the Baptist groups in the various countries including that of the United States with its 14 separate conferences or conventions. The latest returns for members for the five continents reach an aggregate of 10,635,704, for 1926, with 74,296 churches and 57,686 pastors and missionaries.

The Congress of the Alliance at Toronto consisted of 5147 delegates, 2260 visitors and other attendants bringing the total up to 6000 or 7000. In the absence of the President, Dr. E. Y. Mullins, Louisville, Ky., Dr. G. A. Truett, of Dallas, Tex., presided. There was an interesting call of the delegates from the various countries, constituting a three-hour lesson in geography. A carefully prepared program was strictly followed, giving a vast amount of information as to the salient facts of recent Baptist history and conditions in the various parts of the globe. The prepared addresses were interesting as well as informative and striking opinions were given, in many cases, as, for instance, by Dr. Shailer Mathews, of Chicago, to the effect that Christianity should be moral and not theological, and by Professor Marshall, of Toronto, that where the spirit of the Lord is there is liberty,—liberty having always been a Baptist watchword. The delegates from all parts of the world were sturdy friends of peace, and made their ideas thoroughly clear. The closing session, called the "coronation service," because it set forth the crowning message to the Baptist hosts, was a scene of inspiration. "All in all," we are told by a non-Baptist attendant, "a great Congress for all the Christian world, in spite of the invisible barrier of a denominational name."

The Northern Baptist Convention, held in Detroit, in June, laid greater emphasis on evangelism, perhaps, than on any other subject. A well-known New York business man of great religious activity as a lay leader, A. M. Harris, Plainfield, N. J.,

was chosen President for the ensuing year. Dr. Robert E. Speer, secretary of the Presbyterian Board of Foreign Missions, delivered the inspirational address, on "World Redemption—the Purpose of Jesus." Dr. Speer told of a thrilling moment in the recent missionary conference in Jerusalem, when a member from Germany rose and confessed that his country owed a great debt of spiritual reparation for the half century that it had poured out a stream of poisoned thought in a tide of materialistic philosophy and destructive criticism, and the German speaker believed it would be followed by a half century of unclouded witness to Jesus Christ, giving him his proper place in the world.

The Convention spent days in arranging its schedules for active work in the coming year, fixing the total to be raised at $5,100,000. John D. Rockefeller announced gifts of $2,000,000 each to the Baptist Woman's Missionary Society, Home and Foreign, as memorials to his late wife. An interesting item was the calling by a representative of the Disciples of Christ for the appointment of a joint committee on Christian Unity, which the Convention gladly conceded. It was noted that it was a convention of peace: the old controversies were silent.

The Southern Baptist Convention.—This great body has been disturbed by a cloud created by a defalcation in its Home Mission Treasury of close upon $1,000,000. The denomination is asking from its 3,750,000 members voluntary contributions of a dollar each to make up the unprecedented deficit. A subject which has been one of great interest to the Convention,—education—was considered. For nine years this work has been under the direction of a Board of Education. The results did not seem to be satisfactory. For one thing, it involved a debt of about $330,000. The Convention has no authority over the denominational institutions, except three theological seminaries; the secondary schools are under the control of the Board of Home Missions and its colleges are under their own boards of trustees. After a long and able debate it was voted to abolish the Board of Education and appoint a Commission on Education to study the problem, promote a spirit of loyalty to Education and to solidify Baptist ranks behind Baptist education. The Convention decided not to adopt the policy of operating hospitals, with one exception. The Convention took action with great unanimity as did the Northern Convention, later, resolving not to support any Presidential ticket committed against prohibition, by a vote of 4,000 to 6.

THE CONGREGATIONAL COMMUNION

Union Movement.—The Congregational denominations in the United States, Great Britain, and other countries constitute a world communion, which hold a world convention at certain periods. The Congregational churches of the United States, including their missions in a number of foreign countries, carried on for more than a century, have been active in negotiations with various bodies looking to union. A few years ago there was received into organic union a group of churches of German origin known as the Evangelical Protestant Churches. Congregationalists have been in negotiation with the Southern Christian Convention, a small body existing in North Carolina, Virginia and other parts of the south and holding relations with the Christian Church, now known as the American Christian Convention. A conference of the former, held in Richmond, Va., including representatives of 256 churches scattered along the Atlantic from Delaware, Maryland, down to and including North Carolina, came to a unanimous conclusion in May, 1928, in favor of union with the Congregational Churches of that section. A movement of similar purpose, conducted between the Congrgeational Council on Inter-Church Relations and the Commission on Church Unity of the Christian Churches, related to the American Christian Convention, was proceeding and announcement was made in April last that they had reached unanimous agreement

which was accordingly laid before the churches concerned for consideration and action. The agreement as adopted for presentation to the National Congregational Council and the General Convention of the Christian Convention, proposes organic union of the churches of the two denominations, on the basis of recognition by each group that the other group is constituted of Christian churches, each individual church and each group to be free to retain and develop its own form of expression. "Finding in the Bible the supreme rule of faith and life, this union," it is stated, "shall be conditioned on the acceptance of Christianity as primarily a way of life, and not upon uniformity of theological opinion or any uniform practice of the ordinances."

Congregational-Christian Church will be the name of the merged bodies. The appointment of a joint commission to recommend a plan for unification has resulted in a meeting of the Commissions and has issued its report as to the merging of the two bodies. Seven members from each denomination constitute the organization, the Rev. Dr. Sanders, of Rockport, Mass., being the head of the Congregational members and Rev. Dr. Frank G. Coffin, Columbus, O., of the Christian Church. The basis of the merger provides: "That the two National bodies be organically united under the name of the General Council of the Congregational-Christian Churches which shall meet biennially," and that "The recognition by each group that the other is constituted of the followers of Jesus Christ and that each individual church and each group of churches shall be free to retain and to develop its own form of expression." It is further agreed that the "two shall automatically form a single national body to which every individual Congregational or Christian church in the country through its respective state or regional organizations shall be affiliated; that the active ministry of both denominations shall be fully recognized in the new fellowship. The plan also provides for the merging of home and foreign missionary and other benevolent societies of the two organizations. While their respective corporations shall be preserved, they shall be united for administrative purposes. The next meeting of the National Congregational Council is to be held in May next in New York. The General Christian Convention which would have been held in October, 1930, will be brought forward a year, and after it meets the requirements of the plan the two may be merged. The merging of these bodies will make of a denomination of nearly 1,050,000, the largest unification that has taken place in many years.

British Pilgrimage to Plymouth Rock.—An interesting pilgrimage, modeled on the coming of the pilgrims by the "Mayflower" to Plymouth Rock in 1620, came from England last Summer, embracing 1200 Congregationalists of that country. The delegation spent five days on land. There were exchanged on historical spots of more than three centuries ago, the most hearty greetings on the American side and equally hearty responses from the British. One of the interesting incidents was the reproduction of two of the pilgrims of the long ago, Miles Standish and Priscilla Mullens, in the costumes of 1620 by the artistic genius of a Bostonian.

THE DISCIPLES OF CHRIST

This aggressive and growing denomination, over a hundred years old, was brought into existence, because some Baptists were not fully satisfied with the Baptist Association they had joined when they came from Scotland, where they had been Presbyterians. Though it was the result of a secession it began almost immediately to use its influence against Protestant divisions and has stood for biblical oneness as it understands unity and has used biblical terms as "Disciples" in its name or names, and stood for biblical authority. Its 1928 Convention, termed "international," was held in April last in Columbus, Ohio. There were practically four conventions in one, first the International Church Convention, a mass meeting with an elected body called

the committee on recommendations; second, an evangelistic organization, a subject second to no other in the regard of the gathering; then missionary interests are considered at the annual meeting of the United Christian Missionary Society and lastly the Youth's conventions. The Missionary, the benevolent, the temperance, Christian unity and the church erection boards report directly to the International Convention. The Disciples proposed through their delegate to the Methodist General Conference a union with that body and Disciples of Christ and Congregationalists at their New York State conferences represented quite fully the spirit of Christian Unity, which invitation was heartily welcomed.

THE LUTHERAN COMMUNION

Plans for World Convention.—This is the largest of six world communions which have been formed of Protestant groups or families, some of them in recent years. Since the World War the Evangelical Lutheran Churches of the world, particularly those of America and Europe, adopted a plan for a Lutheran World Convention, suggested by the Evangelical Lutheran Council of the United States, and are now arranging for a second world convention to be held in Copenhagen, Denmark, in June, 1929. Meantime, the Executive Committee, having the plans in charge, holds an annual meeting in different centers in Europe to draw various Lutheran bodies closer together and promote Lutheran interests. Among the centers visited are Budapest, from which point deputations were sent to visit Lutherans in Transylvania and Rumania, in Poland and in Czechoslovakia and other places. These are countries where Lutherans are a minority church and where they welcome the encouragement received from the Executive Committee.

United Lutheran Convention.—The sixth biennial meeting of this body, which was organized in New York City, in 1918, was held in Erie, Penn., in October, 1928. The United Church was created by the merging of three general Lutheran bodies, the General Synod, the oldest; the General Council which was an outcome of a conservative movement in the General Synod, leading to division and the United Synod, south. The union has been very successful. Many subordinate synods have in the decennial period merged, thus saving overlapping of these organizations, and leading to the merging of congregations and the saving of expenses due to over-churching in the same communities. The union has been particularly successful in the increase of efficiency in the general organization and its influence on other Lutheran bodies. One of the results that may be attributed to the creation of the United body is the vote taken in 1928 for the merging of three synods of Germanic origin, the Ohio, the Iowa and the Buffalo. These are independent synods, two of which have more than 100,000 communicants each. The United Convention at Erie elected two editors, Dr. Melhorn for the *Luthern*, of Philadelphia, and Dr. Tappert, for the *Lutherischer Herold*. These are official journals of the United Church, a new departure for that body, and are issued by the Lutheran Board of Publication. The Church also has a Board of Education and a Board of Missions whose field of labor is the three Americas. The educational aims are: (1) the devotion of 1930 to the increase of the facilities of the Colleges and theological schools; (2) the promotion of a college in Washington, D. C., for the benefit of women; and (3) the exercise of a deeper influence on Lutheran students in non-Lutheran institutions. A survey has been made of the Church colleges, showing what they have and what they need for the benefit of Lutheran students. The Board of Foreign Missions has work in Japan, China, Liberia, Argentina, India and South America. President Knubel, who visited the leading foreign missions the past year, declares, concerning India, that "there is no work which the United Lutheran Church in America is doing anywhere of any kind which is more prosperous and more promising than our India mission." Of the 142,709

baptized Christians in the foreign fields, 136,555 are in the Andhra country, India.

Board of American Missions.—This is the newest organization of the Convention, being only two years old. Its declared purpose is to evangelize the North American Continent. In the two years of its existence it has added about twenty per cent to the home missionary congregations. Its work is conducted in twelve languages.

Lutheran Work in Languages.—The Lutherans came originally from many different countries in Europe and their church services were therefore greatly diversified as to language,—Dutch, German, Swiss, Scandinavian, Finnish, etc. In the progress of time and the falling off of immigration from European countries its English-speaking congregations have vastly increased. Among the separate Lutheran Churches is the Norwegian Lutheran Church in America, formed ten years ago by the merging of several Norwegian Lutheran bodies. At the General Convention of this Church in 1928 the matter of dropping the word "Norwegian" from the title was discussed and favored, though it was referred to a committee for careful consideration. The idea was to make welcome to their Church of other bodies which do not speak the Norwegian tongue.

Membership.—The Convention of the Lutheran United Church in America gave much discussion to the subject of evangelism and it was agreed that pastors and laymen should unite in a determined effort to increase the membership of the Church in the next two years, when the seventh convention will be held, so that the advance for the two years will be 10 per cent, net. The present membership is 916,858 and if the announced purpose is carried out the grand total will be at least 7,008,543.

The Lutherans and Creeds.—In connection with the recent Biennial Convention of the United Lutheran Convention the question of creeds was historically discussed by the Rev. Charles M. Jacobs in which he aimed to show how large a part it played in the formation of the United Church. It has been, he wrote, more than 350 years since the latest of the Lutheran Confessions was formulated. These were gathered soon after being issued and published in the "Formula of Concord," which is the authoritative collection of these statements. There have been in this long period many controversies and differences among Lutherans on doctrines but no new creed has been proposed or accepted. In Dr. Jacobs' opinion these statements, including the unaltered Rugsburg Confession, and the Apology thereto, the Smalcald Articles and the Large and Small Catechisms of Luther,—all, as given in the Book of Concord, have kept the Church steady and more or less united. All of these doctrinal declarations, he says, are fully acceptable to Lutherans and express their faith as drawn from the teachings of the Bible. All accept the Bible as God's word and these creeds the interpretation of the Book. The War drew most of the Lutheran bodies into cooperative relations, as shown by the National Lutheran Commission and the National Lutheran Council, the latter of which carries on the work done in America and Europe in connection with the Lutheran World Convention, and their basis rests upon the Book of Concord, so that the faith of Martin Luther is the faith of the Lutherans of the twentieth century. It should be added that the Lutherans also accept the Apostles, the Nicene and the Athanasian creeds, and condemn all the errors they condemn. In the opinion of Dr. Jacobs the effect of acceptance of these doctrinal statements has been to draw Lutherans closer together than at any time before the War. Professor Jacobs asks the question why, if adherence to those creeds, could draw Lutherans closer together through the war, they cannot be the basis now for permanent organizations to do the work of the Lutheran faith?

Lutheranism in Soviet Russia.—The second General Convention of the Russian Church was held in September, 1928, in Moscow. It seems not to have been interfered with by Soviet. On the contrary, the latter ap-

proved the acceptance by the Convention of the Lutheran Transcaucasian Synod which is a century or more old. The Convention reported a theological seminary in operation in Leningrad. The Convention decided that the episcopal title has no ecclesiastical authority, but is an honorary designation conferred by the convention on administrative officers and those it may wish to honor.

THE METHODIST COMMUNION

Organization. — This Communion was organized in 1881, in London, when the Ecumenical Methodist Conference was formed consisting of the various Methodist denominations throughout North America, with their foreign missions in the other continents, and of the organizations in Great Britain and Ireland, Europe, Australia, Africa and elsewhere, with their respective foreign missions. The Conference meets decennially, counting from 1881; the latest meeting was in London in 1921, and the next to meet in 1931 in Washington, D. C., or another southern city. A commission in two sections, Eastern and Western, operates in the decennial intervals, the former having its headquarters in London and the latter in the United States. The aggregate for the world communion, 1926, is 11,577,040 members or communicants—9,977,972 for the American section and 1,599,068 in the Eastern section. The population, including members, probationers and adherents, reaches 25,934,076, in the Western, and 6,794,400 in the Eastern section, or a grand total of 32,728,476.

General Conferences.—The chief events in Methodism in 1928 proceeded from the General Conferences of the Methodist Episcopal Church, the largest body in the World Communion, and of the Methodist Protestant Church, the largest non-episcopal body in the United States. The General Conference of the first named body was held in Kansas City, Mo., in the same building in which the National Republican Convention met in the following month to nominate persons for the presidential offices. The Conference, consisting of upwards of 850 ministerial and lay delegates in equal number, representing all annual conferences and presided over by the bishops without the right of debate or vote, does its work through permanent and special committees consisting of delegates who consider and report to the Conference on memorials and other papers referred to them. The Conference discusses and disposes of them by vote, acting under a definite constitution which limits its powers. The Episcopal Address, presented early in the conference, as a statement and review of the conditions and needs of the church, is divided and referred at once to the various committees, its advisements having only the force of recommendations, like those of a presidential message to Congress.

Tenure of Bishops.—The development in the foreign mission fields toward self-support and self-government presented, through the wide discussion preceding the Conference, some of the most important questions, among them the institution of a system of independent action, in the election of bishops for their own conferences and advance toward independent control of their own interests. There was general unanimity in granting something of this kind, but there was division of sentiment as to whether it could be conceded without constitutional action. The more radical members wanted to put all bishops on a term instead of a life tenure, but after a debate, lasting during most of the Conference, the majority were clear that this would be both unwise and unconstitutional and would prevent the kind of leaders needed for the office from accepting it. So the decision was reached that amendments to the constitution by which Central Conferences, such as already exist by authority of the General Conference in India, China and other large mission fields, consisting of representatives of the annual Conferences, should be given power by necessary changes in the constitution to elect bishops for the administration of their particular sections for life terms, and that bishops for the

United States should as heretofore be elected for life tenures. Meantime, bishops are to be elected for particular fields by the General Conference itself.

Autonomy in Missionary Churches.—The Conference adopted a declaration as to the purpose of foreign missions that it is to make Christ known to all peoples as their divine savior, to persuade them to become his disciples, who are to be gathered into Christian churches and to become eventually self-propagating, self-supporting, self-governing bodies. This shows how far toward autonomy the idea of missionary churches had advanced. They are not to be kept in leading strings but to be given initiative, responsibility and authority.

Christian Unity was in high power in the Conference. A proposition to invite the Presbyterian Church of the U. S. A., the oldest and largest of the Presbyterian group, to unite with the Methodist Episcopal Church, was adopted enthusiastically, to which the former body whose General Assembly was in session at Tulsa, Okla., gave a favorable response. Later on there came a wider invitation from the Protestant Episcopal General Convention, in session in Washington, D. C., asking the Presbyterian Churches, Northern and Southern, and the Methodist Churches, Northern and Southern, to meet with a Commission of the Washington body to consider the matter of union among the four bodies. Meantime, there is pending the question of unification between the Methodist Episcopal Church and the Methodist Episcopal Church, South. The Conference at Kansas City, Missouri, took no action on the latter because by action of the Southern Methodist Conference two years ago, it was postponed until 1930. The Kansas City Conference appointed a commission on comity, coöperation and union to receive all pending and other propositions on the subject for the coming four years; also two other similar commissions. It is to consist of five bishops, fifteen ministers and fifteen laymen.

Disciplinary Matters.—Various subjects relating to changes in disciplinary matters came before the conference, including the one which has long been pending, relating to the admission of laymen to the annual conference, which is and has always been exclusively ministerial. Many plans for this have been heretofore proposed, but none have passed the ministerial conferences as being satisfactory. Another plan passed the General Conference at Kansas City, which a General Laymen's Organization of the church pronounces unconstitutional and therefore declares it will not support it.

Action on Divorce.—The General Conference took action on the matter of divorce, deploring the looseness of practice which has come into use, declaring it accepted the divorce laws of the states as legal and recognizing such interpretation of the rules by pastors to permit them to marry couples where the offense committed by either party is equivalent to Christ's declaration allowing it. The Board of Bishops, at their November meeting, issued a warning, intended evidently, to prevent ministers from making careless interpretations, and also to note that a state's decision might be erroneous.

Income for Missions.—The income for benevolent purposes, especially home and foreign missions, indicated at the end of October last an increase of considerably over $1,000,000 for the foreign board after several years of decline.

War and Prohibition.—The declaration of the General Conference against any relaxation in the enforcement of the Constitution and the law against the liquor traffic was, like that of most other denominational conferences, positive and strong. So, also, was its pronouncement for the outlawry war by the acceptance of Secretary Kellogg's proposed pact with various other nations.

The Broadway Methodist Temple.—This very large and comprehensive Church, whose existence is now assured, is to cost $5,500,000. At first it was thought it might be completed for about $4,000,000, but later on it was found that not less than

$5,500,000 would insure its success on an adequate plan. In the last year, therefore, $1,500,000 was added to the amount first called for and the additional sum was obtained by a few very large subscriptions, including another of $100,000 from John D. Rockefeller, Jr., who has given in all to the enterprise $475,000, though his own great church on the eve of completion was burned down. The Broadway Temple is to embrace a church and a hotel, with all other necessary appliances for a church and is to have an illuminated gold cross 700 feet above the pavement, surmounting the highest church building in America. There is also to be a Byrd Aviation beacon at this notable top. The pastor expects in three years to have a congregation of 3000 worshipers. A hotel, as well as a church, is to be included, the earnings of the hotel to be used for the maintenance of the building and its religion services.

The Methodist Protestant Church.—The largest of the non-Episcopal Methodist bodies observed its hundredth anniversary in 1928. It was a division from the Methodist Episcopal Church, due to the feeling that episcopacy and presiding eldership bred autocracy. It maintains the itinerancy, but the appointments are not made by any one man, but by a committee, there being an appeal to the conference itself. The church was organized in 1928 at Baltimore. President Lewis reported the membership at 201,494, the highest in the hundred years. After the report of President Lewis, who has served several terms of four years each, the Rev. John Calvin Broomfield, D.D., of Pittsburgh, Penn., was elected as his successor. Eminent leaders of other churches, Bishop Murray, of the Protestant Episcopal Church; Dr. S. P. Cadman, of the Federal Council of Churches; Dr. J. Ross Stevenson, President of Princeton Theological Seminary, and Bishop Burns, of the Methodist Episcopal Church attended and delivered fraternal greetings. Four societies and two boards were merged into two societies and the two official weeklies were combined in one, but the two editors were re-elected. The total of the denominational benevolences was fixed at $2,000,000 for the coming year.

Negro Methodist bodies in the United States are mostly Episcopal, the chief of which are the African Methodist Episcopal, the African Methodist Episcopal Zion and the Colored Methodist Episcopal, there being also, not only smaller colored bodies, but a considerable number of Negro members in the Methodist Episcopal Church with two active Negro Bishops.

THE PRESBYTERIAN WORLD COMMUNION

Organization.—The full official title of this communion is "Alliance of the Reformed Churches Throughout the World Holding the Presbyterian System." It was organized in London in 1875; and has held twelve meetings of its general council, its supreme body. The latest was in Cardiff, Wales, in 1925; the next will be in Boston, Mass., in 1929. There are 11 Presbyterian branches in the United States, one in Mexico, three in Canada, three in England, two in Ireland, five in Scotland, and nineteen in Europe, the latter called by the Reformed title. There are additional bodies in the other continents.

Presbyterian Church in the U. S. A.—The General Assembly of this, the oldest and largest, Presbyterian Church in the United States, was held in Tulsa, Okla., in May, 1928. The session was scarcely disturbed by the old controversy, which touched upon a doctrinal matter, but in such a way that the constitution prevented, in the judgment of the Assembly a reopening of the question. The management of Princeton Theological Seminary, which has been several years under consideration, came up at Tulsa on majority and minority reports from a special committee of eleven, appointed in 1927, to investigate conditions in the Seminary. A motion was adopted at Tulsa by a considerable majority, that further consideration of the reports be postponed for a year and that the Board of Directors be ordered to proceed immediately to

compose the differences in the Seminary and report on the matter next year.

The regular work of the church received much attention, including the need of enlarging the opportunities of young people to take larger privileges and duties in the Church. Provision was made for proper training of young people appointed to serve as directors of education in the churches and certain oversight was placed in this matter in the hands of presbyteries. An invitation from the General Conference of the Methodist Episcopal Church to appoint a committee to serve with a similar committee of that body on organic union of the two bodies was adopted; but a similar request to create committees on union with the Congregationalist, Christian and Universalist bodies was not accepted. A committee was appointed to consider whether a revision of the *Book of Common Worship* is needed, and if so, to provide for it. Dr. Hugh Kelso Walker, of Los Angeles, Cal., was elected Moderator for the year, succeeding Dr. Robert E. Speer.

Atlanta Session.—The General Assembly of the Presbyterian Church in the U. S. (Southern) was held in Atlanta, Ga., with Dr. Harris E. Kirk of Baltimore, Md., as Moderator. The reports presented show a net gain in membership during the year of 5,056, instead of a net loss as in the preceding year, reaching 22,256. The Assembly continued a committee on union with the United Presbyterian Church appointed in 1927 for another year. To this committee was also referred the question of union with the Cumberland Presbyterian Church, and the matter of investigating cases where presbyteries of the Northern and Southern churches overlap and report what can be done. The question of divorce was referred to a committee for consideration and report, next year. An appeal was ordered to be sent to the churches to endeavor to secure a 10 per cent increase of membership the coming year. The assembly observed the centenary of the Theological Seminary located near Atlanta, Ga.

REFORMED CHURCH IN AMERICA

Annual Meeting.—The General Synod of this body celebrated, at its 122nd annual meeting, the tercentenary of the existence in the United States of the Reformed Dutch Church. The 300th anniversary was recognized by representatives from other denominations in New York, as well as by ministers and members of the Reformed Church in the Netherlands. A message from the Queen of Holland was presented. The Synod, which is a body of more than 151,000 communicants, transacted its usual annual business. The Synod received an invitation from its sister church, the Reformed Church in the United States (German), to unite with it, but with an expression of appreciation it was referred to an appropriate committee for consideration.

Bible from Dutch Queen.—Of historical and inter-denominational interest was the presentation, not in connection with the tercentenary proceedings, but subsequently thereto, by Queen Wilhelmina, of Holland, of a famous edition of the Bible in Dutch, through the Holland Ambassador to the United States, J. H. Van Royen, to Bishop Manning for the Episcopal Cathedral of St. John the Divine. The ancient book, called the "Staaten Bijbel," is the Dutch translation of the Holy Bible, was printed in 1637. It is considered as authoritative, though a more modern translation has been made. Her majesty's message indicated that the gift was to be considered "as a proof of the interest taken by the Netherlands in the religious life of America."

THE SALVATION ARMY

Many who see little of this religious social organization, except now and then in its numerous local centers of operation, are probably not aware that it has become widely established in the countries and continents of the world. It has increased in membership in the United States, where Commissioner Railton, appointed by General William Booth, established it in 1880, to over 81,000 men and women who are active workers, dressed in uniform. There are

over 1700 places of operation for their religious and social work and a corps of over 4700 officers, commander (in charge), colonels, majors, captains and other leaders who conduct the extensive work in military fashion. In London, at the close of 1928, a high council of commanders and commissioners, 63 in number, met to confer on matters of high moment. Among them was the question whether General Bramwell Booth, head of the world movement, with powers equal to those wielded by his father and predecessor, should be asked to resign that a stronger leader might take his place with reduced powers. General Booth declined to resign, or submit to removal. Much property is under his control and a plan was under consideration by which a committee might be raised to have oversight of it. The large majority of the Council, it appeared, desired a younger and stronger head, under rules fixing his powers.

CENSUS OF CHURCHES IN UNITED STATES

Denominations and Members.—Decennially the U. S. Census Office gathers statistics of the churches, the latest being for the end of the year 1926. Schedules are sent to each organization or congregation. The summary shows that there are 213 denominations with 226,718 organizations or congregations and 54,624,676 members or communicants. This total cannot, however, be compared with that of 1916 because the method of numbering the members of the Jewish bodies has been changed. The total then reported was 357,135, while in 1926 it is 4,087,357. The total then reported was 357,135, while in 1926 it was 4,087,357. The former count included heads of families, or seatholders and contributors only. The members of the Christian Church, Scientist, numbering 202,098 in 1926, were not returned in 1916. Moreover, the population, instead of the communicants, as in the decades prior to 1916, is given in 1926, including baptized as well as confirmed members. The gain of the Church of Christ, Scientist, since 1909, when it ceased to return members, is 136,381, or at the rate of 6,817 members a year.

The following tabulation includes denominations having memberships exceeding 200,000.

Denomination	*Member Communicants*
Methodist Episcopal	4,080,777
Southern Baptist	3,524,378
National Baptist (Negro)	3,196,623
Methodist Episcopal, South	2,487,694
Presbyterian U. S. A.	1,894,030
Protestant Episcopal	1,859,086
Disciples of Christ	1,377,595
Northern Baptist	1,289,966
United Lutheran	1,214,340
Lutheran Synod of Missouri	1,040,275
Congregationalists	881,696
African Methodist Episcopal	545,814
Latter-Day Saints (Mormon)	542,194
Norwegian Lutheran Church	496,707
African Methodist Episcopal Zion	456,813
Presbyterian Church (Southern)	451,041
Churches of Christ (Disciples)	433,714
United Brethren in Christ	377,436
Reformed Synod in the U. S. (German)	361,286
Evangelical Synod of North America	314,518
Lutheran Augustana Synod	311,425
Lutheran Synod of Wisconsin	229,242
Lutheran Joint Synod of Ohio	217,873
Evangelical Church (formerly Association)	206,060
Colored Methodist Episcopal Church	202,713
Church of Christ Scientist	202,098

THE ROMAN CATHOLIC CHURCH

By John B. Kelly

Catholic Writers' Guild of America

SCOPE OF CHURCH WORK

Official Catholic Year Book.—An event of great importance to Catholicism in America has been the issuance of *The Official Catholic Year Book*, with the approval of the Hierarchy, for the first time in this country. This book discloses the vast, varied, spiritual and material interests of the Catholic Church. The *Year Book* sets

forth great masses of information plainly, accurately and concisely, in view of which it may be well in this summary to lay main emphasis on the life and work of the Catholic Church in the United States.

Personnel Force.—The Church's invariable method in her work is the one revealed in the Incarnation: the conveyance of divine power in and through the human touch; hence the lavish use of specially qualified men and women. There are 25,773 priests at work in this country, an increase of over 5,000 in ten years, while nearly 15,000 students are training in seminaries, an increase of some 7,000 in ten years. Then again, the Church has a force of 35,000 religious and lay, carrying on the work in 612 hospitals throughout the land. Add to these figures the tens of thousands of men and women at work in schools, colleges and universities and an impressive total is reached, all toiling for the extension of divine influences in this and other lands.

Conventions.—In 1928, there were twenty-seven national, annual Catholic conventions held in this country, and eleven such held in foreign lands. These were gatherings relating to the most divergent human concerns from The National Catholic Educational Association in this country to The Agricultural Congress in Paris.

Benefactions.—Private benefactions in the form of money-gifts and bequests, apart from gifts of property of other kinds, have totaled $5,540,000 during 1928, which amount does not include the regular offerings of Catholics generally, and is made up of special gifts for definite objects.

Historical Societies.—An interesting feature in Catholic work is in connection with its historical societies in the United States, as well as throughout the world. "American Catholics," Leland writes, "have done more for their history than have any of the Protestant bodies." There are at present thirteen Catholic historical societies, national and state, in this country, with their publications. The day is anticipated when every diocese will have its historical society which will have proper housing for the three divisions, Archives, Library and Museum.

SCHOOL SURVEY

The survey made by the National Catholic Welfare Conference shows a total of 2,111,560 children in Catholic elementary schools, Chicago leading all dioceses with 335 schools. The Jesuits have announced plans for a great university in Los Angeles, and have begun work on the first unit of nine buildings to cost $5,000,000. Fifty-nine Catholic schools conducted summer sessions. The new Library of Louvain University, built by American benefactions, was dedicated by Cardinal Roey, Archbishop of Malines, on July 4th, 1928.

THE PRESIDENTIAL CAMPAIGN

Through the Presidential candidacy of Alfred E. Smith, a Catholic, bitter attacks were made on the Church, and called forth a number of non-Catholic champions in defense of the basal American principle of religious freedom as guaranteed by the Constitution. Among these were Dr. Nicholas Murray Butler of Columbia University; Ellery Sedgewick, editor of *The Atlantic Monthly;* Rev. Dr. Henry Van Dyke, ex-Moderator of the Presbyterian General Assembly; Rabbi Stephen Wise; Ralph Adams Cram and John W. Davis. The Catholic clergy remained silent through this storm, and won for themselves high praise from men of all creeds.

FOREIGN EVENTS

Mexico.—The struggle of the Church against persecution in Mexico shows no signs of abatement. The assassination of President-elect Obregon was assigned an ecclesiastical origin and motive without foundation, as it now appears. "There can be no lasting peace in Mexico until the facts are frankly faced and the errors committed in the heat of revolution corrected."

The Eucharistic Congress was held in Sydney, Australia, last summer. Cardinal Bonaventura Cerretti was named as Papal Legate to the Congress, and the theme for the Congress chosen by the Pope was "The

Blessed Eucharist and Our Lady." Pilgrims in vast numbers were present at the Congress from all parts of the world.

Encyclicals.—During 1928, His Holiness, the Pope, issued two great Encyclicals,—"On the Promotion of True Religious Unity," and "On the Reparation Due the Sacred Heart of Jesus from Mankind."

THE CATHOLIC PRESS

In the fulfillment of her divine mission, the Roman Catholic Church uses many human means, chief among which is the press. In fact, without criticism of the secular press, the Church has built up in many lands what may properly be called a Catholic press. At the International Press Exhibit held at Cologne in 1928, there was a Catholic Department under the charge of an International Catholic Committee, specially formed for the purpose. In Paris, French Catholic writers have established a permanent exhibit of Catholic literature of the present day. At the International Press Exhibition at Cologne, the National Catholic Welfare Conference News Service not only sent a large exhibit itself, but invited the Catholic press throughout the United States to participate from May to October. The work of the News Service fills a deep need in the Church. It regularly serves 80 newspapers in the United States, Canada and eleven other countries, touching on the leading Catholic events throughout the world each week, with special cable service of immediate Catholic news from European capitals, as well as a weekly Washington letter interpreting national trends and events of interest to Catholics. In Washington, the News Service is the only service principally for religious papers which enjoys the privilege of admission to the press galleries of Congress for the reason that it is the only service of its kind which has complied with the rules laid down by Congress for admission. This privilege opens to the News Service all official news sources and brings to it all the current governmental reports which the great secular news services receive.

NATIONAL CATHOLIC WELFARE CONFERENCE

The Executive Department alone has eight different bureaus in full operation. The N.C.W.C. *Bulletin* is an official, illustrated monthly account of the work of the various bureaus which are: N.C.W.C. *Bulletin*, Immigration, Historical Records, Publications, Publicity and Information, Motion Pictures, Business and Auditing. Some of the matters dealt with by these bureaus may be mentioned to show their scope and diversity: the distribution of sacramental wine, without onerous inconvenience, to priests; the accommodations for Catholic worship in parks under Federal control; knowledge and distribution of schedules of the tariff referring to the importation of altars, statues and other articles for church use or furnishing; cooperation with the Federal Government in the taking of religious censuses; helping Catholic broadcasting stations in appeals to the Radio Commission; defending laws that prohibit the use of the mails for immoral and obscene purposes. All these things are under the Executive Department of the N.C.W.C., with larger and more varied activities under the other departments: Education, the Press, Social Action, Legal and Lay Organizations; each department with its headquarters and staff, and all in close cooperation with one another.

JUDAISM AND JEWISH COMMUNAL AFFAIRS

By Bernard G. Richards

Executive Secretary, American Jewish Congress

COMMUNAL ACTIVITIES

Extension of Movements.—The past year witnessed the intensification and enlargement of many of the Jewish communal religious and philanthropic activities throughout the United States. These efforts have previously been described as being divided into a number of roughly-designated movements, substantially as follows: 1. religious education for the young and the training of rabbis, teachers and social workers; 2. the building of new synagogues and temples and the spread of the popular movement for the establishment of community centers; 3. work of charity among the needy at home and the destitute abroad still suffering from the aftermath of the Great War; 4. support for the upbuilding of the Jewish National Homeland in Palestine; 5. efforts to protect the interests and establish the rights of Jewish Minorities in Eastern European lands.

Synagogue Council.—The various organizations and federations called into being for the furtherance of Judaism and Jewish educational and philanthropic interests remained practically the same as those referred to in previous reviews with the exception of the creation of a Synagogue Council of America, Dr. Abram Simon, chairman, for the purpose of united action in, or public presentation of certain general matters affecting the Jewish religion, in which all shades of belief can agree, and the announcement of plans for the formation of the Menorah Association, Judge Irving Lehman, Honorary President; a body which is to continue and to extend to larger circles the work for Jewish culture and ideals, erstwhile conducted by the Intercollegiate Menorah Association.

JEWISH EDUCATION

The Jewish Educational Association of New York, Israel Unterberg, President, which, under the active leadership of Bernard Semel, Honorary Secretary, encourages the establishment and endows various schools, has campaigned and secured larger funds for its activities, these being paralleled by different bodies in a number of large cities west and south. In a number of these large cities, like Chicago, Boston, Cleveland, Detroit, St. Louis, San Francisco, etc., there exist colleges or schools for the training of religious teachers for the requirements of the various schools in different communities, those which are attached to synagogues and temples, like the commission on education of the Union of American Hebrew Congregations, as well as those which are conducted independently by associations of Jewish men and women especially interested in the subject.

Supplementary Bodies. — Supplementing the educational and cultural activities of other bodies are: Young Judea, an organization of the Jewish youth, sponsored by the Zionists, Rabbi Israel Goldstein, President; Avukah, American Student Zionist Federation, Max Rhoade, President; Menorah Intercollegiate Association, Henry Hurwitz, Chancellor; the Hillel Foundation for work among students, fostered by the Independent Order B'nai Brith, Alfred M. Cohen, President.

Theological Seminaries.—The most important occurrence of the year among institutions designed for the training of the Rabbinate was the enlargement of the ultra-orthodox Yeshiva, or Isaac Elchanan Seminary, of the lower east side of New York, and the opening of its new building in the extended form of a Yeshiva College located at Amsterdam Avenue and 186th St. The Yeshiva College, of which the Reverend Dr. Bernard Revel is President, will combine a traditional Jewish and Talmudic education with a modern course of col-

lege studies, offering for the first time an example of a college modeled along parochial lines.

The three other large Jewish colleges for the training of Rabbis and teachers of religion have experienced a year of considerable activity and progress, all of them recording a marked increase in the interest of their work and support, and adding important volumes to remarkable collections of Jewish books in their libraries. These institutions are the Hebrew Union College in Cincinnati, Dr. Julian Morganstern, President; the Jewish Theological Seminary of America, New York City, Dr. Cyrus Adler, President; and the newer Jewish Institute of Religion of New York City, Rev. Dr. Stephen S. Wise, President, which has just entered upon its seventh year of existence.

SYNAGOGUES AND COMMUNITY CENTERS

New Temples.—A large number of new temples and synagogues have been built in different cities during the past year, and in many instances very elaborate edifices have been erected with adjoining communal or social centers, libraries and lecture rooms.

Established and New Forces.—In the work of the synagogue and the extension of its influence in the direction of religious training and general Jewish education, bodies like the Union of American Hebrew Congregations, Charles Shohl, Honorary President, representing the reformed wing of Judaism; United Synagogue of America, S. Herbert Golden, President, speaking for the conservative or the middle-of-the-road elements; and the Union of Orthodox Jewish Congregations of America, Herbert S. Goldstein, President, aiming to conserve the old and traditional attitude, have played an important rôle during recent years. Among the newer forces in the religious life of the Jews of America are the National Federation of Temple Sisterhoods, Mrs. J. Walter Freiberg, President, and the National Federation of Temple Brotherhoods, Roger W. Straus, President.

Community Centers.—Significant advance has been made in a number of different cities during the year by the popular movement for the creation of Jewish community centers or Hebrew young men or women's associations, serving in most instances as combined houses of worship, religious schools and places of recreation. The Jewish Welfare Boards, Justice Irving Lehman, President, a joint outgrowth of early centralized activities of the Young Men's Hebrew Associations with later ministrations to Jewish members of the United States army and navy, especially from the World War, now directs its chief efforts toward the encouragement of the establishment of these and other Jewish social centers, and the development of educational and literary programs for them.

PALESTINE

World Zionist Organization.—The Zionists have, with the help of fellow Jews of varying degrees of sympathy, gone on with their large and laborious effort to reestablish the national Jewish homeland in Palestine in accordance with the Balfour Declaration of the English Government, and the mandate granted by the Peace Conference to Great Britain. In this mandate the World Zionist Organization is legally recognized as the Jewish Agency with which the Colonial Office in London and the British Administration in Jerusalem are to deal in all matters relating to the furtherance of Jewish aims in Palestine.

Homeland Participation Agreement.—The idea, long propounded and discussed at Zionist Congresses, of the extension of this agency so as to include and receive the support of larger circles of the Jewish people, has, after four years of debate, at last taken form in an agreement reached among Dr. Chaim Weizmann, the President of the World Zionist Organization, a group of prominent American Jews headed by Louis Marshall, Felix M. Warburg, and Colonel Herbert H. Lehman, and representative Jews in other lands, to enter into this agency, which is to be made up of one hundred and fifty

persons, and is to consist of 50 per cent Zionists and 50 per cent non-Zionists. This plan was brought to a head by the conference of non-Zionists held in New York last October and a meeting of the General Council of the World Zionist Organization, held in Berlin in December, these deliberations having been based on the report of a non-partisan Commission of Experts which investigated conditions in Palestine. Although the project is still a subject of some controversy, it is assumed that it will be ratified by the next Zionist Congress in Europe in July, and that shortly thereafter the agency which is expected to give substantial support to colonization plans will begin to function. Meanwhile the Zionists are encouraged in their own present efforts in Palestine by the return of more favorable conditions generally following the financial depression of two years ago.

POST-WAR RELIEF

The American Joint Distribution Committee, representative of several relief groups, and under the chairmanship of Felix M. Warburg, has, continuing its extensive work of relief among Jewish sufferers of the Great War in Europe, concentrated especially on a large plan of establishing agricultural settlements in Crimea and other parts of Russia for the benefit of Russian Jews who have been economically displaced by the Soviet régime. A munificent contribution of $5,000,000 was donated to this purpose by Julius Rosenwald toward the new fund of $10,000,000 (a notable contribution of $500,000 having also been contributed by a non-Jew, John D. Rockefeller, Jr.). This forms a sequence to the work of the previous year begun through a fund raised by the United Jewish Appeal under the Chairmanship of David A. Brown, and which previous fund was designated for work in Russia and other countries. Despite the improvement brought about through the agricultural work in Russia, reports of Jews suffering in the large cities are causing much concern in Jewish circles which are also disturbed by the relentless antagonism of the Russian authorities to Judaism as well as to all other religions and educational work of a Hebraic character.

SAFEGUARDING EQUAL RIGHTS

Eastern Europe.—Violations of the rights of Jewish citizens and other forms of discrimination practiced from time to time in various Eastern European countries, notably in Hungary, Poland and Rumania, have continued to form the basis of activities; namely, representations to the governments in behalf of just treatment, and appeals to public opinion of the American Jewish Congress, Dr. Stephen S. Wise, President; the American Jewish Committee, Louis Marshall, President, and similar bodies abroad like the Joint Foreign Committee of England, Lucien Wolf, Secretary; and the Council for the Rights of Jewish Minorities, Geneva, Nahum Sokolow, Chairman, which the American Jewish Congress helped to organize at the Conference in Zurich, Switzerland, in August, 1927. Fortunately the change of government in Rumania and the accession to power of a premier such as Juliu Maniu, a professed friend of genuine liberalism and the rights of minorities, and the public assurances of fair play already given by the new Cabinet, offer one ray of hope in the otherwise beclouded outlook of Eastern European Jewry.

Massena "Ritual Murder" Incident.—The combatting of various brands of anti-Semitism forms another phase of activities of the above organizations. In this connection the circulation for the first time in this country of the ancient and grotesquely horrible charge of "ritual murder" as exemplified in the Massena, N. Y., incident of October of the past year, constituted a depressing occurrence, though the prompt action of the authorities and the completeness of retraction on the part of the culprits rendered some measure of comfort. Sources of encouragement in this regard are also the activities of several agencies sponsored by Christians to spread good will and remove intolerance between Jews and Christians.

COGNATE SOCIETIES

NATIONAL CHURCHES

AMERICAN CONGREGATIONAL ASSOCIATION.—14 Beacon St., Boston, Mass.

AMERICAN UNITARIAN ASSOCIATION.—25 Beacon St., Boston, Mass.

ANGLICAN UNIVERSAL CHURCH OF CHRIST IN THE U. S. A.—22 E. 38th St., New York, N. Y.

BOARD OF DIRECTORS OF THE GENERAL SYNOD OF THE REFORMED CHURCH IN AMERICA.—25 E. 22nd St., New York, N. Y.

CENTENARY CONSERVATION COMMITTEE OF THE METHODIST EPISCOPAL CHURCH.—111 Fifth Ave., New York, N. Y.

CHRISTIAN SCIENCE CHURCH.

CONGREGATIONAL CONFERENCE, INC.—287 Fourth Ave., New York City, N. Y.

CONGREGATIONAL NATIONAL COUNCIL.—287 Fourth Ave., New York, N. Y.

FREETHINKERS' SOCIETY OF NEW YORK.—226 W. 58th St., New York, N. Y.

FRIENDS' GENERAL CONFERENCE.—140 N. 15th St., Philadelphia, Pa.

GENERAL CONFERENCE OF SEVENTH-DAY ADVENTISTS.—Takoma Park, Washington, D. C.

GENERAL COUNCIL OF THE PRESBYTERIAN CHURCH IN THE U. S. A.—156 Fifth Ave., New York, N. Y.

NATIONAL LUTHERAN COUNCIL IN AMERICA.—437 Fifth Ave., New York City.

NATIONAL SPIRITUALIST ASSOCIATION.—600 Penn Ave., S. E., Washington, D. C.

NORTHERN BAPTIST CONVENTION.—5109 Waterman Ave., St. Louis, Mo.

SOCIETY FOR ETHICAL CULTURE OF NEW YORK.—2 W. 64th St., New York, N. Y.

THEOSOPHICAL SOCIETY, AMERICAN SECTION.—826 Oakdale Ave., Chicago, Ill.

UNION OF AMERICAN HEBREW CONGREGATIONS.—Merchants' Building, Cincinnati, O.

UNION OF ORTHODOX CONGREGATIONS OF AMERICA.—276 Fifth Ave., New York, N. Y.

UNION OF ORTHODOX JEWISH CONGREGATIONS OF AMERICA.—131 West 86th St., New York, N. Y.

UNITED LUTHERAN CHURCH IN AMERICA.—437 Fifth Ave., New York, N. Y.

UNIVERSALIST GENERAL CONVENTION.—176 Newburg St., Boston, Mass.

VEDANTA SOCIETY.—34 W. 71st St., New York, N. Y.

VOLUNTEERS OF AMERICA.—34 W. 28th St., New York, N. Y.

INTERNATIONAL ORGANIZATIONS

ALLIANCE OF REFORMED CHURCHES THROUGHOUT THE WORLD HOLDING THE PRESBYTERIAN SYSTEM.—510 Witherspoon Building, Philadelphia, Pa.

ASSOCIATION FOR THE PROMOTION OF CHRISTIAN UNITY.—504 N. Fulton Ave., Baltimore, Md.

BAPTIST WORLD ALLIANCE.—Bates College, Lewiston, Me.

CENTRAL BUREAU OF EVANGELICAL CHURCHES IN EUROPE.—105 E. 22nd St., New York, N. Y.

COMMITTEE ON COOPERATION IN LATIN AMERICA.—25 Madison Ave., New York, N. Y.

CONTINUATION COMMITTEE OF WORLD CONFERENCE ON FAITH AND ORDER.—P.O. Box 226, Boston, Mass.

ECUMENICAL METHODIST CONFERENCE.—145 Westervelt Ave., Plainfield, N. J.

INTERNATIONAL ASSOCIATION OF DAILY VACATION BIBLE SCHOOLS.—381 Fourth Ave., New York, N. Y.

INTERNATIONAL CONGREGATIONAL COUNCIL.—14 Beacon St., Boston, Mass.

INTERNATIONAL CONGRESS OF RELIGIOUS LIBERALS.—25 Beacon St., Boston, Mass.

INTERNATIONAL COUNCIL OF RELIGIOUS EDUCATION.—1516 Mallers Bldg., 5 S. Wabash Ave., Chicago, Ill.

INTERNATIONAL EVANGELISTIC BUREAU OF THE U. S. A.—1111 Walnut St., Cairo, Ill.

INTERNATIONAL SOCIETY OF CHRISTIAN ENDEAVOR.—41 Mt. Vernon St., Boston, Mass.

LAMBETH CONFERENCE, ANGLICAN COMMUNION.—Bishop of Winchester, England.
LUTHERAN WORLD CONVENTION.—437 Fifth Ave., New York, N. Y.
PROTESTANT UNITY LEAGUE.—500 Fifth Ave., New York, N. Y.
UNIVERSAL CHRISTIAN CONFERENCE ON LIFE AND WORK.—70 Fifth Ave., New York, N. Y.
WORLD'S STUDENT CHRISTIAN FEDERATION.—347 Madison Ave., New York, N. Y.
WORLD'S SUNDAY SCHOOL ASSOCIATION.—1 Madison Ave., New York, N. Y.

INTERCHURCH ORGANIZATIONS

AMERICAN SECULAR UNION.—P. O. Box 1156, Chicago, Ill.
AMERICAN SUNDAY SCHOOL UNION.—1816 Chestnut St., Philadelphia, Pa.
CHAPLAINS' AID ASSOCIATION.—401 W. 59th St., New York, N. Y.
CHRISTIAN UNITY FOUNDATION.—70 Fifth Ave., New York, N. Y.
CHURCH PEACE UNION.—70 Fifth Ave., New York, N. Y.
COMMISSION OF REFERENCE AND COUNCIL COMMITTEES.—25 Madison Ave., New York, N. Y.
CONFERENCE OF THEOLOGICAL SEMINARIES AND COLLEGES.—Lancaster, Pa.
COUNCIL OF CHURCH BOARDS OF EDUCATION.—111 Fifth Ave., New York, N. Y.
FEDERAL COUNCIL OF CHURCHES OF CHRIST IN AMERICA.—105 E. 22nd St., New York, N. Y.
FELLOWSHIP OF RECONCILIATION.—Bible House, New York, N. Y.
FEDERATION OF CHURCHES.—71 W. 23rd St., New York, N. Y.
INTERDENOMINATIONAL EVANGELISTIC ASSOCIATION.—Winona Lake, Indiana.
NATIONAL COUNCIL OF PROTESTANT EPISCOPAL CHURCHES.—281 Fourth Ave., New York, N. Y.
NATIONAL FEDERATION OF RELIGIOUS LIBERALS.—700 Oakwood Boulevard, Chicago, Ill.

AUXILIARY ORGANIZATIONS

CATHOLIC CHURCH EXTENSION SOCIETY OF THE U. S. A.—180 N. Wabash Ave., Chicago, Ill.
CATHOLIC GUARDIAN SOCIETY.—130 W. 37th St., New York, N. Y.
CATHOLIC PROTECTIVE SOCIETY.—477 Madison Ave., New York, N. Y.
EPWORTH LEAGUE OF THE METHODIST EPISCOPAL CHURCH.—740 Rush St., Chicago, Ill.
KINGS DAUGHTERS AND SONS.—280 Madison Ave., New York, N. Y.
LORD'S DAY ALLIANCE.—156 Fifth Ave., New York, N. Y.
PRISON EVANGEL ASSOCIATION.—156 Fifth Ave., New York, N. Y.
SUNDAY SCHOOL COMMISSION, INC.—416 Lafayette St., New York City, N. Y.
WOMAN'S CHRISTIAN TEMPERANCE UNION.—Evanston, Ill.
WOMAN'S NATIONAL SABBATH ALLIANCE.—156 Fifth Ave., New York, N. Y.
YOUNG MEN'S CHRISTIAN ASSOCIATION.—347 Madison Ave., New York, N. Y.
YOUNG WOMEN'S CHRISTIAN ASSOCIATION.—600 Lexington Ave., New York, N. Y.
UNITED SOCIETY OF CHRISTIAN ENDEAVOR.—411 Mt. Vernon St., Boston, Mass.

RELIGIOUS PUBLICATIONS

AMERICAN BAPTIST PUBLICATION SOCIETY.—1701 Chestnut St., Philadelphia, Pa.
AMERICAN BIBLE SOCIETY.—Bible House, New York, N. Y.
AMERICAN TRACT SOCIETY.—7 W. 45th St., New York, N. Y.
CHICAGO TRACT SOCIETY.—440 Dearborn St., Chicago, Ill.
GIDEONS.—140 S. Dearborn St., Chicago, Ill.
INSTITUTE OF SOCIAL AND RELIGIOUS RESEARCH.—370 Seventh Ave., New York, N. Y.
RELIGIOUS EDUCATION ASSOCIATION.—308 N. Michigan Ave., Chicago, Ill.
NATIONAL TESTAMENT AND TRACT LEAGUE.—200 Kellogg Bldg., Washington, D. C.
POCKET TESTAMENT LEAGUE.—156 Fifth Ave., New York, N. Y.
RELIGIOUS PUBLICITY.—701 W. 177th St., New York, N. Y.
SOCIETY FOR THE PROPAGATION OF THE FAITH.—343 Lexington Ave., New York, N. Y.

SOCIETY OF BIBLICAL LITERATURE AND EXEGESIS.—Broadway at 120th St., New York, N. Y.

MISSIONARY

AMERICAN BOARD OF COMMISSIONERS FOR FOREIGN MISSIONS.—14 Beacon St., Boston, Mass.

AMERICAN McALL ASSOCIATION.—1710 Chestnut St., Philadelphia, Pa.

CHRISTIAN AND MISSIONARY ALLIANCE.—260 W. 44th St., New York, N. Y.

CONTINUATION COMMITTEE OF THE WORLD MISSIONARY CONFERENCE.—25 Madison Ave., New York, N. Y.

COUNCIL OF WOMEN FOR HOME MISSIONS.—156 Fifth Ave., New York, N. Y.

FEDERATION OF WOMEN'S BOARDS OF FOREIGN MISSIONS.—25 Madison Ave., New York, N. Y.

FOREIGN MISSIONS CONFERENCE OF NORTH AMERICA.—25 Madison Ave., New York, N. Y.

INTERNATIONAL MISSIONARY CONFERENCE.—347 Madison Ave., New York, N. Y.

INTERNATIONAL MISSIONARY UNION.—71 W. 23rd St., New York City, N. Y.

NEAR EAST RELIEF.—151 Fifth Ave., New York, N. Y.

STUDENT VOLUNTEER MOVEMENT FOR FOREIGN MISSIONS.—25 Madison Ave., New York, N. Y.

WOMAN'S UNION MISSIONARY SOCIETY.—67 Bible House, New York, N. Y.

PART SIX
SCIENCE—PRINCIPLES AND APPLICATION

DIVISION XVIII
MATHEMATICS AND ASTRONOMY

MATHEMATICS

By Tomlinson Fort
Professor, Lehigh University

RESEARCH AND ANALYSIS

Review.—About four hundred papers were presented to the American Mathematical Society during 1928. All of these were accepted by the program committees as embodying original research. An analysis of this vast amount of work, only a small part of which has as yet been published, is out of the question. However, it is possible to review the papers published during the year and to point out that which, in the judgment of the reviewer, is significant. This is done with apologies to the authors of the fine papers which it is impossible to mention.

Polygenic Functions.—Perhaps the most significant series of papers in analysis published in America during 1928 were those by Edward Kasner on "Polygenic Functions." Mathematicians have built a large structure by their studies of functions of a complex variable. Nearly all this study has been of monogenic functions, that is of functions where the value of the derivative is independent of the path of approach. Kasner's papers display the theory of monogenic functions as a special case of the theory of polygenic functions. For example, if the values of the derivative of a polygenic function at a point are plotted in the complex plane, they form a circle. He calls this a clock due to the method in which he generates it in this research. The papers in question were published in (a) *Bulletin of the American Mathematical Society*, July-August. (b) *Transactions of the American Mathematical Society*, October. (c) *Bulletin of the American Mathematical Society*, September-October. These papers make interesting reading to the mathematician and open up vistas for his imagination as to the possible developments of a large theory.

Calculus of Variations.—Another field of research that has been very fruitful during 1928 is the Calculus of Variations. This is an old branch of mathematics that has been studied for almost two hundred years, although until recently but few Americans were actively interested in it. However, there is almost no subject that is receiving more attention now from American mathematicians. The *Transactions of the American Mathematical Society* alone during 1928 devoted 144 pages to papers immediately on the Calculus of Variations. There are several things that have contributed to this increased activity. About twenty-five years ago Hilbert of Goettingen pointed out with force and clearness the fundamental rôle that this subject plays in analysis. But of more direct influence than

Hilbert has been the work of G. A. Bliss who through his courses at the University of Chicago, his research papers, his presidential address before the American Mathematical Society and his *Carus Monograph* has been the prime leader in putting the subject before the American Mathematical public.

The Calculus of Variations has to do primarily with the minimizing of a definite integral. This like many other things in mathematics may appear at first glance to be of small moment but when studied intensively it develops into a more and more complex problem with a wide bearing on mathematics and natural science. It is interesting to note that it is even being applied in the field of economics. Authors that deserve mention in connection with the Calculus of Variations are R. G. D. Richardson, Marston Morse, D. R. Davis, D. E. Richmond, T. H. Rawles and C. F. Roos.

Analysis situs has continued to occupy an important place in American research. It has been defined as "the study of these properties of point sets which are invarient under one to one continuous transformations." The prominence of the subject in America is due to R. L. Moore of the University of Texas. Others particularly to be mentioned here are G. T. Whyburn, W. M. Whyburn, J. R. Kline, W. A. Wilson and J. W. Alexander. The address by Kline published in the March-April issue of the *Bulletin of the American Mathematical Society* should be read by any one seeking more detailed information on the subject. Alexander has investigated the subject of knots and has proved most interesting theorems as to essential differences between them: witness his paper in the April number of the *Transactions of the American Mathematical Society*. Probably more papers on analysis situs have been published during the year than in any other comparable field of mathematics.

Geometry.—If we exclude analysis situs from geometry we must admit that geometry lags somewhat from the very high position that it should occupy in research. The most active geometric school in America at present probably centers around Princeton and research in differential geometry by L. P. Eisenhart and O. Veblen and their recent students occupies a prominent place in mathematical thought. The work of E. B. Stouffer of Kansas, E. P. Lane of Chicago and Soloman Lefshetz of Princeton should also be mentioned as should that of J. L. Coolidge and W. C. Graustein of Harvard although significant publications during 1928 in some cases are lacking. The Colloquium lectures by A. B. Coble are mentioned elsewhere. James Pierpont of Yale wrote extensively on optics in hyperbolic space. This is worthy of more than passing mention as a study in pure geometry and raises interesting speculations as to applications in physics. The best present tool for the description of much of the experience is non-Euclidean geometry and it is possible that this development of geometric optics in hyperbolic space ready at the hand of the physicist may also prove of value in describing some of the phenomena of natural science.

Infinite series is at present the most active mathematical subject in England, and in recent years divergent infinite series has been one of the most active subjects in America. But there seems to have been a lull in publication on this subject. It is to be hoped that there is to be no decline in the development of this field. Papers on series and the closely allied topic of Approximation were presented to the American Mathematical Society or published during the year by Dunham Jackson, Tomlinson Fort, D. W. Widder, W. J. Trjitzinsky, J. L. Walsh and others. The last author, Prof. Walsh of Harvard, has published a particularly valuable series of papers on the expansion of analytic function in series of polynomials and in series of other analytic functions. It is surprising that this subject has not already been more thoroughly studied considering the fundamental rôle that expansion into power series has played in the study of functions of

a complex variable. J. F. Ritt published a paper on Dirichlet series in the January issue of the *American Journal of Mathematics*. He establishes an analogue to a well-known theorem of Picard on power series and defines and studies asymptotic Dirichlet series.

Expansion problems in terms of orthogonal sets of solutions of linear differential equations has been a favorite field for research in the United States. This activity is largely the result of the inspiration of the late Maxime Bôcher of Harvard and has been actively carried on by G. D. Birkhoff and men who have received their inspiration from him. Birkhoff spent much of 1928 abroad, and the volume of published research on this type of expansion problem seems to have declined during the year.

Linear difference equations have received a significant addition to their theory in the paper by C. R. Adams published in the July issue of the *Transactions of the American Mathematical Society*. He adds existence theorems in the field of analytic functions of a complex variable for the so-called irregular case where the coefficients are integral rational functions.

The theory of numbers and general algebraic theories are most actively studied by E. T. Bell of California and by L. E. Dickson of Chicago and his past students. Several papers appeared during 1928.

The theory of groups continues virile in spite of one hundred and fifty years of continuous growth. G. A. Miller of Illinois is the most abundant writer on this subject. Among his papers was one in the *Transactions of the American Mathematical Society* for January on generators of the alternating and symmetric groups.

Statistics has not been neglected by American Mathematicians. A paper appearing in the January issue of the *Transactions of the American Mathematical Society* of particular interest was "The Apportionment of Representatives in Congress," by E. V. Huntington. At first sight this seems a simple problem but unexpected mathematical complications arise and Prof. Huntington is driven to a long paper for its complete treatment. His most important result is that the method of "equal proportions" has certain advantages over the several other methods that have been proposed notably over the method of "major fractions" now in use. An interesting paper was published in the June issue of *Annals of Mathematics* by F. M. Weida on "Various Concepts of Correlation." This paper should be of assistance to statisticians who have not closely followed the mathematical developments showing as it does how the correlation method of Pearson now so widely used is only one of various methods, and what methods are suited to particular types of data.

Newtonian Mechanics. — Publication of research in Newtonian mechanics has not been large. Attention is called however to a paper in the October *American Journal of Mathematics* by H. E. Buchanon on periodic orbits of three finite masses.

Logical principles have caused much conversational discussion among mathematicians and significant addresses on this subject were made by James Pierpont and Arnold Dresden in December, 1927. These addresses were published in the *Bulletin of the American Mathematical Society*, January-February, 1928, and July-August, 1928. Other papers published during the year were few in number and in the judgment of the reviewer not of great moment.

HISTORY OF MATHEMATICS

Research in the history of mathematics is largely published in the *American Mathematical Monthly*. This is true in spite of the fact that the *Bulletin of The American Mathematical Society* is described on its cover as "A Historical and Critical review of Mathematical Science," and in spite of the fact that *Isis*, the official journal of the History of Science Society, welcomes papers relative to mathematics. A number of short papers have been published during the year. Important expected developments are the appearance of a fac-

simile and translation of the Ahmes Papyrus by A. B. Chace, the publication of a source book and the re-establishment of the *Journal Bibliotheca Mathematica* in America.

MATHEMATICAL PHYSICS

The most significant developments in mathematical physics center around quantum theories and in particular the so-called wave-mechanics with which the name of Shroedinger is prominently connected. This mechanics has as its object the study of atomic phenomena for which the older or Newtonian mechanics has proved inadequate. Chronologically it follows closely upon the theory of relativity. The Einstein theory is best illustrated by the methods used in studying the siderial system. Due to the remoteness from everyday experience of the phenomena observed, it is natural that a critical study of the methods of the astronomer and astrophysicist be made and that from this would grow an attempt to set up a rigorous general physics analogous to the various systems developed in pure mathematics. Einstein's astounding success has influenced the outlook of thoughtful man on the external world very profoundly. On the other hand wave-mechanics focussed on the atom also is changing this outlook, simplifying and reducing much to fundamental undefined elements. The American Mathematical Society and the American Physical Society held a joint symposium on quantum mechanics in New York in December. Men especially to be mentioned in connection with this work are: J. C. Slater, E. U. Condon and Hermann Weyl.

RESEARCH LOCALE

The question as to where work is being done is always interesting. A count readily shows that mathematical research is not localized to any one section and the number of papers produced by persons connected with smaller institutions compares favorably with the number produced at the great universities in spite of the greater handicaps on the worker. If we limit ourselves to the three journals, *Transactions of the American Mathematical Society*, *American Journal of Mathematics*, and *Annals of Mathematics* we find that the authorship of the one hundred and fifteen papers which they published during 1928 was distributed as follows: New York 19, Texas 17, Illinois 13, Massachusetts 11, New Jersey 8, Connecticut 6, Pennsylvania 5, Rhode Island 3, Oregon 3, Maryland 3, Wisconsin 2, Louisiana 2, North Carolina 1, West Virginia 1, Missouri 1, Oklahoma 1, Nebraska 1, Vermont 1, Colorado 1, Iowa 1, Michigan 1, Minnesota 1, Ohio 1, Indiana 1, California 1, Canada 2, Europe 8.

PUBLICATIONS

Notable books published during the year were *The Proceedings of The International Mathematical Congress at Toronto* in two volumes: *Dynamical Systems*, by G. D. Birkhoff; *Non-Riemannian Geometry*, by L. P. Eisenhart; *Linear Difference Equations*, by P. M. Batchelder; *Functions of a Real Variable*, by E. J. Townsend; *History of Mathematical Notations*, Vol. I, by Florian Cajori and *Sir Isaac Newton*, a collection of addresses edited by F. E. Brasch with an introduction by D. E. Smith. Numerous textbooks for collegiate and secondary instruction appeared during the year.

Journals.—The *Transactions of the American Mathematical Society* is edited by Dunham Jackson, Edward Kasner and H. H. Mitchell. It is the pride of Amercian Mathematicians that no journal in the world is of higher standard than the *Transactions*. The *Bulletin of the American Mathematical Society* is too well-known to require comment. A new editor-in-chief, Prof. W. R. Longley of Yale, took office December 29. The respective editors of the *American Journal of Mathematics*, *Annals of Mathematics*, the *American Mathematical Monthly* and the journals devoted to elementary mathematics all issued their usual fine volumes. The *Mathematics News Letter*, which is a small journal published by the Louisiana-Mississippi section of the Mathematical Association of America,

is a creditable enterprise worthy of being especially mentioned.

ADDRESSES

Expository addresses made before the American Mathematical Society were: The Gibbs lecture by G. H. Hardy of Oxford University entitled "An Introduction to the Theory of Numbers"; The Colloquium lectures at the Amherst meeting by A. B. Coble on "The Determination of the Tritangent Planes of the Space Sextic of Genus Four"; "Recent Developments in Projective Geometry," by E. B. Stouffer, also on the same topic by E. P. Lane; on certain topics in analysis situs by E. W. Chittenden, P. S. Alexandroff and J. R. Kline. Addresses were made in New York in December by W. F. Osgood and J. L. Coolidge. Expository addresses were also made at meetings of the Mathematical Association and at the meeting of Section A of the American Association for the Advancement of Science.

PRIZES IN MATHEMATICS

Awards.—The Frank Nelson Cole prize in algebra was awarded to Prof. L. E. Dickson of the University of Chicago. The Maxime Bôcher prize was awarded to Prof. J. W. Alexander of Princeton for his work on combinatorial analysis situs. These prizes were named for two illustrious American mathematicians and the winning of either of them is a great achievement.

Donation.—W. B. Ford made a donation to the Mathematical Association of America to make the awarding of the Chauvenet prize for mathematical exposition more frequent.

MEETINGS

The American Mathematical Society held meetings as follows: New York City, Feb. 25, Apr. 6-7, Oct. 27, Dec. 27-31. Chicago, Apr. 6-7, Dec. 31. Cincinnati, November 30, Dec. 1. Amherst, Mass., Sept. 4-7. Sectional Meetings were held at Lawrence, Kan., Berkeley, Calif., Stanford University, Calif., and Portland, Ore.

The Mathematical Association of America held meetings in conjunction with the meetings of the Society at Amherst in September and in New York in December. It also held numerous sectional meetings. The Association concerns itself with collegiate mathematics rather than with research with which the society is primarily concerned.

Symposia on "Analysis Situs" were held at Princeton University and in New York and on "Projective Differential Geometry" in Chicago and on "Quantum Mechanics" in New York.

The Pi Mu Epsilon, national honor fraternity in mathematics, held its annual meeting in New York in connection with the meeting of the American Association for the Advancement of Science. This fraternity added Chapters at both the University of Kansas and the University of Nebraska during the past year.

National Council of Teachers of Mathematics.—This meeting at Boston, Feb. 24-25, was of special interest. Among the speakers were George B. Olds, H. W. Tyler and H. E. Slaught. The National Council is an organization of the teachers of secondary school mathematics. It is incorporated and its officers hope soon to have an enrollment of ten thousand.

FOREIGN VISITORS AND AMERICANS ABROAD

Among distinguished mathematical visitors to America were Constantin Caratheodory of Munich, G. H. Hardy of Oxford, Paul Alexandroff of Moscow, and Heinze Hoph of Berlin. Prof. Caratheodory was the first official visiting lecturer of the American Mathematical Society and lectured under the auspices of the Society at a number of universities. Mention has already been made of the Gibbs lecture by Prof. Hardy and of a lecture by Prof. Alexandroff.

A number of American mathematicians were abroad to attend the International Mathematical Congress at Bologna, Italy. D. E. Smith and W. B. Ford, both well-known mathematicians, lectured at various places in Europe under the auspices of the

Carnegie Endowment for International Peace and Oswald Veblen gave a course of lectures at Oxford, England. Several Americans held the Guggenheim Fellowships for the study of mathematics abroad and not less than thirteen were holders of National Research Fellowships for part of the year at least.

The appointment of Prof. Hermann Weyl of Zurich as Jones Research Professor of Mathematical Physics at Princeton is of great interest as bringing to America one of the ablest of mathematical physicists.

ENDOWMENT

The increasing cost of publication and the widening scope of the American Mathematical Society have in recent years made the financing of its undertakings extremely difficult. Six years ago it was decided to try to raise an endowment of one hundred thousand dollars, the income from which was to help with this burden of finance. Mathematicians generally were without financial connections and the public was without a proper appreciation of the value of mathematical research. Great difficulty has been encountered. At the present time the endowment fund totals eighty thousand dollars, about one-third of which has been contributed by members of the Society. As these are in large part college teachers, their salaries are small and the amount contributed by them is a splendid showing. Finances continue difficult. No greater service could be done to the cause of research and learning by persons of wealth than by contributing to this fund. Another way in which a number of corporations and individuals are aiding the Society is by contributing regularly to its support as sustaining members. Without this help the present activities of the Society would be impossible, to say nothing of desired expansion.

ASTRONOMY

By Bancroft Walker Sitterly

Van Vleck Observatory, Wesleyan University

PROVISION FOR GREATEST TELESCOPE

Arrangements.—The International Education Board has authorized the establishment of a new astrophysical observatory under the control of the California Institute of Technology, with the coöperation of the Mount Wilson Observatory of the Carnegie Institution of Washington. The principal instrument of the observatory is to be a reflecting telescope with a mirror two hundred inches in diameter—just twice the size of the Mount Wilson giant which is now the largest in the world. The location of the telescope is not yet decided upon; to take proper advantage of the instrument's enormous light-gathering power, the atmosphere through which it looks should be at once as transparent and as steady as possible. At various sites at high altitudes in southern California and on the Arizona plateau, tests of the "seeing" are being carried on. A thoroughly equipped astrophysical laboratory on the California Institute's campus in Pasadena will serve as "home base" for the observatory staff and headquarters for the Institute's graduate school of astrophysics; here plates will be measured, observations reduced and interpreted, and laboratory investigations carried on. The Observatory Council directing the project, G. E. Hale (chairman), R. A. Millikan, A. A. Noyes, and H. M. Robinson, with Dr. J. A. Anderson as executive in immediate charge of design and construction, will have the cooperation and assistance of leaders in astronomy, the physical sciences, and engineering in all parts of the country.

Power.—The new telescope will concentrate at its focus four times as much light as the Mount Wilson 100-

inch, and it is hoped that the use of fused quartz (much less sensitive to temperature disturbances than glass) for the great mirror will substantially improve the definition of the focused image. The primary focus will be only fifty-five feet from the mirror; hence the maximum illumination will be available for study of extremely faint objects. As with the 100-inch, auxiliary mirrors and lenses will provide greater focal ratios for various purposes. Spectroscopic, photographic, and radiometric apparatus of the most efficient design will be provided. The mounting will probably be of the fork type. As the mirror alone will weigh something like thirty tons, and the whole instrument must turn in every direction with the utmost possible smoothness and the least possible flexure of any part, the design of this mounting is itself a major engineering problem.

Service.—The power of the new telescope will extend the range of astronomical observation in two ways: first, the diameter of the *visible* universe will be more than doubled, and perhaps a billion hitherto invisible stars and nebulæ will be revealed; second, brighter objects, already under observation with our telescopes and spectroscopes, will be studied in greater detail, and a great number of stars of intermediate brightness will be made accessible to the newer methods of optical and radiometric analysis, which hitherto have been applicable only to the most brilliant stars.

OBSERVATORIES

South Africa.—This year, the new station established by the Detroit Observatory of the University of Michigan, at Bloemfontein, Orange Free State, has joined the three other recently opened South African branches of American observatories—Harvard, Yale, and Smithsonian Astrophysical—as a "going concern." Last May, the Lamont 27-inch telescope started the program of double-star measurement and discovery for which it was built under the direction of the late Professor Hussey. Up to October 2nd, Dr. Rossiter and his staff had discovered four hundred and ten new pairs and also measured as many pairs previously known. At the southern station of Harvard College Observatory, removed in 1927 from Arequipa, Peru, to Mazelspoort, just outside Bloemfontein, permanent buildings for the Bruce 24-inch doublet and five smaller cameras are under construction; and the Metcalf 10-inch triplet and the "sky-patrol" camera have been at work all year in temporary quarters.

In South America, the abandonment of Harvard's Peruvian station has been followed by the sale to the Catholic University of Chile of the equipment of the Mills Expedition, which the Lick Observatory of the University of California sent to Santiago in 1903 to measure the radial velocities of the brighter southern stars (see below, *Stellar Velocities*).

In the United States, the Flower Observatory of the University of Pennsylvania has been almost inactive since the death of Professor Doolittle in 1920, undergraduate teaching having taken up all Dr. Barton's time. The appointment of Professor C. P. Olivier of the University of Virginia to the directorship of Flower will make possible the resumption of research with the Observatory's unusually complete instrumental equipment.

The 70-inch glass disc for the Perkins reflecting telescope of Ohio Wesleyan University, the largest made in America, was cast at the United States Bureau of Standards, Washington, in May, 1927, and cooled and annealed for eight months. In January of this year the mold was opened and the disc found to be of very good quality. During the summer an eight-inch hole was bored through it, so that it may be used with a convex auxiliary mirror of the Cassegrain type, as well as with a Newtonian flat. The grinding of the mirror's surface to the correct parabolic curve will probably take place within the next year or two.

PERSONNEL NOTES

The Bruce Medal of the Astronomical Society of the Pacific was awarded for 1928 to Dr. Walter S.

Adams, Director of the Mount Wilson Observatory.

The Draper Medal of the National Academy of Sciences was awarded for 1928 to Dr. William H. Wright, Astronomer in the Lick Observatory.

Changes.—Dr. John A. Anderson, Astronomer in the Mount Wilson Observatory, was elected a member of the National Academy of Sciences. Dr. Charles G. Abbot, Director of the Smithsonian Astrophysical Observatory, was appointed Secretary of the Smithsonian Institution. Professor Ernest W. Brown of Yale University was elected President of the American Astronomical Society for the years 1928-31.

Dr. William H. Wright of Lick Observatory delivered the second George Darwin Lecture before the Royal Astronomical Society of London on June 8th. His subject was "Photographs of the Brighter Planets by Light of Different Colors."

INTERNATIONAL ASTRONOMICAL UNION

The International Astronomical Union held its third triennial meeting at Leiden, Holland, from July 5 to 13; almost 250 astronomers attending, including 38 from the United States. The nations now members of the Union number 24, all represented at this meeting but Brazil, Greece, and Mexico. In addition, representatives of Austria, China, Esthonia, Germany, Hungary, Lithuania, and Russia were present, and it is expected that some at least of these nations will adhere to the Union by the time of the next meeting. The elaborate arrangements made for the entertainment of the delegates by the Observatory and University of Leiden and the Government of Holland were greatly enjoyed.

Among the matters discussed in the committees, which do the active work of the Union, may be mentioned preparations for observing the close approach—within seventeen million miles—of the asteroid Eros in 1931; the progress, slow but definite, of the great Astrographic Catalog of stars, still far from completion after forty years; new precise standards of wavelength in the solar spectrum (see below, *Solar Spectrum*); the possible establishment of observatories in the southern hemisphere for the study of the variation of latitude, and the addition of a new northern station in Central Asia and an equatorial station in Java; and revision of the boundaries of the constellations. The Union accepted the invitation of the United States for the next meeting, to be held not in 1931, but in 1932, at some place not too far from the track of the total solar eclipse which will occur in the summer of that year. This eclipse will pass across Hudson's Bay, the Province of Quebec, Vermont, New Hampshire, Maine, and out into the Atlantic, on the afternoon of August 31st. A large number of those who attended the Union's meetings went on into Germany to the sessions of the *Astronomische Gesellschaft*, the great Central European society of astronomers, at Heidelberg, July 18th to 21st.

SUN

Spot Activity.—The last sun-spot maximum was in 1917, and the next preceding one in 1905. Since maxima occur eleven years apart, more or less, another is due about this time. The sun-spots this year and in 1927 were about equally abundant, more so than any other year since 1917, and more so than in 1905, but the activity does not quite match that of 1917. Whether this year actually is the maximum will not appear till the spots are clearly seen to be on the wane, for successive maxima often differ widely in character and the law of variation is not well understood. If this is the culmination, the current maximum is less intense than the last, but its activity has been maintained near high-tide over an unusually long interval. A comparison of the numbers of sun-spots seen since 1880 shows an alternation of high, narrow maxima and lower wider ones, and the present one seems to fit well into the series—so far. The cause of sun-spot periodicity is still a complete mystery.

Solar Eclipses.—There were two solar eclipses during the year, but

one was partial and the other total only in the Antarctic, so that no addition was made to the observations which astronomers have been slowly accumulating through centuries, on the corona, chromosphere, and immediate solar neighborhood. However, several discussions appeared during the year, of results obtained at previous eclipses, of which Campbell and Trumpler's detailed account of the measurement of plates, taken to show the Einstein displacement of stars near the sun, is particularly noteworthy. The plates were taken in Australia in September, 1922, by a Lick Observatory expedition, and preliminary results were given out in 1923, indicating that a displacement existed of about the right size. This year's paper confirms the displacement; and the weighted mean of the results from two different instruments is *exactly* the same as that predicted from Relativity Theory. This precise agreement is of course accidental, but the probable error is only five per cent. Furthermore, the observed variation in the displacement with distance from the sun follows Einstein's law quite closely. The authors also point out that the observations do not fit certain non-relativistic explanations (such as that mentioned below) which have been advanced.

The expedition to the eclipse of January, 1926, sent to Sumatra by Sproul Observatory of Swarthmore College, took photographs especially to investigate the effect of possible abnormal refraction at the edges of the moon's shadow-cone. If this could cause a displacement of stars close to the eclipsed sun, it should also increase the apparent diameter of the moon during the eclipse. But the results of the test, now published, show no perceptible increase, certainly not one of the required amount. This expedition has published also extremely fine photographs of the complex maximum-type corona which appeared at the eclipse.

SOLAR SPECTRUM

Wave-lengths.—Since its publication in 1895-97, the "Preliminary Table of Solar Spectrum Wave-lengths" of Rowland has been the standard of the world. But thirty years have brought great advances in the technique of wave-length measurement, notably the introduction of interferometry, and approximate corrections to Rowland's values have long been in use. Extensive series of new measures have been made, one series by the Allegheny Observatory and the Bureau of Standards working in collaboration, and two separate series at the Mount Wilson Observatory. For several years sections of the former work have been published by Allegheny, and this year the Carnegie Institution has brought out a "Revision of Rowland's Preliminary Table" by Dr. St. John and others of the Mount Wilson staff.

The new wave-lengths were found by comparing a great number of evenly-spaced solar lines with internationally adopted standard laboratory lines. The wave-lengths of these lines have been determined with the interferometer from the primary standard of wave-length,—the red cadmium line, λ 6438.4696. The solar wave-lengths found in this way were compared with Rowland's values, the differences plotted and a curve drawn, from which corrections to the Rowland values for the fainter lines were read off. The resulting corrected wave-lengths of twenty thousand lines are probably dependable nearly to one part in a million. An additional table gives eighteen hundred lines in the infra-red region, beyond the reach of Rowland's plates. The intensity of each line, and so far as known the element giving it, and its temperature class and theoretical series relation, are tabulated also. The whole is an outstanding example at once of precision and comprehensiveness.

A comparison of the intensities of the Rowland lines with the series relations between them has been carried out also at Mount Wilson by Dr. Russell, Director Adams, and Miss Moore. Though the theory of line spectra is in a state of upheaval today, provisional formulæ in which some confidence may be placed may be derived, connecting the relative

numbers of atoms in various excited states with the relative strengths of the lines they produce. By comparing these theoretical strengths with Rowland's observed intensities, it is possible to relate the latter directly to the number of atoms that produce them. The relation is, of course, only approximate, and it gives only proportions of atoms, not absolute numbers, but it gives us one more line of attack upon the constitution of the sun's atmosphere and the atmospheres of those stars which are bright enough for detailed study with the spectroscope.

Corona.—The spectrum of the solar corona has been hitherto very puzzling. Upon a continuous background, perhaps due to incandescent solid material, appear faint Fraunhofer lines, indicating reflected sunlight, and numerous emission lines, some strong and some weak, which have not been identified with those of any known element or compound. It has been suggested that some known element, under the very unusual conditions of temperature and tenuity which the corona presents, might be capable of giving these lines, or that some combination unknown to our laboratories (*e.g.*, a hydrogen-helium molecule) might be stable under such conditions. Now Freeman, at the University of Chicago, has compared the relations of the coronal lines with those of the spectrum of *argon*, recently analyzed by Meissner. He finds that about half the known lines of the corona, among them most of the prominent ones, agree with observed *argon* lines within the accuracy of the measures, and that nearly half the remaining coronal lines, including the strongest of all,—λ 5303, may be identified similarly with theoretically possible *argon* "combination-lines" which have not been observed. These results recall Bowen's striking identification last year of many nebular lines with those of ionized nitrogen and oxygen.

NEPTUNE

Rotation.—The outermost known planet, Neptune, is so distant that its small, faint disc shows no well-defined markings even in our most powerful telescopes. So we cannot directly see how rapidly it rotates; but there are several indirect ways to detect the rotation. If the planet is not uniformly bright all over, but has lighter and darker regions, its total brightness seen from the earth will fluctuate as it turns. Such a fluctuation, in a period near eight hours, has been found. Also, Neptune has a moon, travelling about it in an orbit whose plane has been observed to shift its direction continuously, as does the plane of our own moon's orbit. Our moon's orbit shifts because the earth is not spherical but oblate, and the plane of the earth's equator is not the same as that of the moon's orbit, so that the gravitational effect of the earth's oblateness perturbs the moon's motion. Now, the earth is oblate because it rotates. If the shift of the orbit of Neptune's moon is similarly explained, then Neptune must rotate; its speed of rotation (assuming a plausible constitution of its interior) determines its oblateness, and the oblateness determines the rapidity of shift. A mathematical study on these lines, which was carried out in 1926, gave Neptune a period of rotation between sixteen and twenty-two hours.

A third method of investigation is with the spectroscope. If Neptune rotates, one side of its disc is approaching and one receding, and by Doppler's principle the lines of Neptune's spectrum should be accordingly altered in wave-length. This summer Moore and Menzel at Lick Observatory announced that this effect had been detected, and that the velocities measured gave a rotation-period between fifteen and seventeen hours. It may be noted that the last two methods agree in giving a period about double that of the first. But the first result may indicate that Neptune turns toward us either one darker and one lighter half in a rotation of eight hours, or two darker and two lighter quarters in a rotation of sixteen hours. The spectroscopic measures show also that Neptune rotates "forward" like the earth, though its satellite revolves "retrograde" like

the outermost satellites of Jupiter and Saturn.

COMETS

Nineteen-twenty-eight has been an off-year for comets: only three have been discovered. Reinmuth at Heidelberg discovered the first on a photograph taken February 22nd. He afterward found it on a plate that had been taken three weeks earlier. It takes about seven years to revolve around the sun in an orbit not unlike that of an asteroid. On March 17th the second comet was found by Giacobini of Paris. The third was discovered by Forbes of Capetown, South Africa, on November 21st. It was much brighter than the other two, being estimated by its discoverer as sixth magnitude. For a few days it was visible in small telescopes, but soon ran in too close to the sun. Its orbit and that of Giacobini's comet are at present still uncertain. No less than six of 1927's ten comets were followed into 1928; of them Stearns' comet has been followed now for a year and three-quarters and is still visible, though farther from us than Jupiter. But Holmes's and Taylor's periodic comets, due in the summer and fall of 1928, were not found.

METEORS

There is apparent in this country an encouraging revival of interest in the much-neglected study of meteors,—a revival due in large measure to the efforts of Dr. C. P. Olivier, the country's foremost authority on meteors, and the head of the American Meteor Society. The observation of meteors is one branch of astronomy where the amateur really has an advantage over the professional, for the equipment necessary includes only watch, pencil, star-maps, and leisure time at night,—the last being the most important. The active members of the Meteor Society have observed thousands of meteors in the past year and determined radiants for many showers, gathering material of real importance for theoretical discussion. It is to be hoped that the Society will flourish as vigorously as the American Association of Variable Star Observers, whose members, mostly amateurs, are contributing to our knowledge of long-period variables at the rate of over fifteen hundred observations a month.

STARS

Positions.—Before any understanding of the solar system could be attained, it was necessary to accumulate hundreds of years of laborious observations of the planets' places and motions. An understanding of the enormously more complex and gigantic stellar system must wait on similar and still more laborious observations of the stars. Fundamental to our knowledge of stars' places and motions is the most precise possible knowledge of their directions, such knowledge as is embodied in the star catalogues which fill the shelves of astronomical libraries. Comparison of such catalogues reveals the minute changes of place due to the movements of the stars among themselves, from which careful analysis enables us to infer the motion of the sun through space, the related motions of stellar groups, and an astonishing amount of information about the arrangement of the stars in space.

The preparation of a star catalogue is a very exacting piece of work, for it is impossible to adjust the meridian circle with which the observations are made so that it is absolutely without error; and even if it were possible, the atmosphere through which the observer looks would still be a source of error. So the errors from all sources have to be determined and allowed for. Some of these errors may be evaluated by reversing everything reversible about the instrument and testing the observer in various ways; but there are other errors whose effects can be disentangled only by "reversing" the whole observatory, moving it bodily to another latitude, the farther the better. This was actually the procedure adopted by the Dudley Observatory of Albany, in 1909-10, when they shipped their meridian circle and observers to San Luis, Argentina, to make precise observations not only of far southern stars which were out of

their reach at Albany, but also of many stars which had been observed already at Albany with the same instrument. The resulting catalog of 15,333 stars was published by the Carnegie Institution of Washington this last summer, and though the positions of the far southern stars take up the bulk of the volume, it is the introductory discussion of those star-places that were measured both at San Luis and Albany, with the corrections deduced from the discussion, that will be of primary interest and importance to the makers and interpreters of star catalogs.

Velocities.—From the observed changes in the direction of a star from year to year can be found its velocity at right angles to the line of sight, if the star's distance is known. The apparent change is so slow that observations over several decades are generally needed for even a moderately good result; moreover, for only a few stars are the distances known to more than the roughest approximation. To find a star's velocity *in* the line of sight requires only one observation (though more of course increase the accuracy), and the star's distance need not be known. All we need is a good photograph of the star's spectrum, showing sharp images of the spectrum lines, and showing also images of the lines of a comparison spectrum (of iron, for instance), usually produced by a spark adjacent to the spectroscope. By Doppler's principle, the line-of-sight or radial velocity of the star with reference to the observer shows itself as a shift of the star lines with reference to the comparison lines: simple—but not without its own difficulties. Like the shifts in the direction of the star, which the meridian circle seeks to measure, the shifts of the spectrum lines are very small, and very largely affected by the slightest maladjustment of the spectroscope. Extreme care has to be taken, particularly to keep the temperature of the spectroscope uniform throughout the necessarily long exposure of the photograph. Furthermore, only for a comparatively bright star can a measurable spectrum be photographed within a practicable exposure time; and even a bright star may have lines too diffuse to be measured.

In the overcoming of the difficulties of this work the Lick Observatory of the University of California has taken a leading part. It was at Lick that Campbell in 1896, with a spectroscope of his own design attached to the 36-inch telescope, made the first radial velocity determinations whose precision reached present-day standards. Five years later he became Director of the Observatory, and to the present time radial velocity work has been first on the Lick program. It has been a major aim of this program to obtain reliable velocities for all stars above the sixth magnitude. The sixteenth volume of Lick Observatory Publications, published in 1928, contains the result of more than thirty years' pursuit of this program by more than thirty observers, among whom the major responsibility and credit belong to Director Campbell and Astronomers Moore and Wright. The volume contains velocities of 2743 stars. Of these, 351 have variable velocities, indicating that they revolve in orbits, with companion stars; 81 more are suspected of variability. On 28 other stars, observations were made but trustworthy velocities were not obtained. These stars are not all above sixth magnitude in brightness, but they include all but 69 of those stars. All the 69 have been observed at other observatories, and they are listed in a supplementary table.

Of equal importance with the accuracy and inclusiveness of this great body of material is its homogeneity. The 25,000 spectrograms obtained were all taken either with the 36-inch refractor at Mount Hamilton, or with the 37-inch reflector of the Lick southern station maintained from 1903 to 1928 at Santiago, Chile, and the same observers, in general, took plates at both stations. From time to time changes were made in the spectroscopes and measuring-machines, and the results have been carefully correlated to remove discontinuities in the work due to the changes. Velocities have been found for many of the

stars at other observatories also, and a comparison has been made between all these measures and those at Lick. The final catalog appears nearly free not only from accidental but from systematic error. In the words of a reviewer, its publication "definitely places work on stellar radial velocities among the *exact sciences.*" A statistical discussion of the velocities is included in the volume, yielding a value for the motion of the sun through the system of stars, in the direction of the small star *Omicron Herculis*, thirteen degrees southwest of Vega, at the rate of twelve and two-tenths miles a second. Mean velocities are given for stars of the different spectral types, and values of the "K-term."

Stars and Comets.—The shifts of stellar spectrum lines tell us of velocities, but the lines themselves tell us through what the starlight has passed on its way to us. A few of the lines are put in by the earth's atmosphere and a few by tenuous material drifting loose in space—the "calcium clouds" discussed in this column last year—but most are due to the atmosphere of the light-giving star. Among these appear, in the spectra of cooler stars, lines or bands of cyanogen, which does not dissociate at the comparatively low temperature of these stars. At the Harvard Observatory, the cyanogen bands have also been detected in some stars so hot that it is very hard to see how the cyanogen molecules could exist intact in their atmospheres; and these bands are blurred and show large displacements, mainly toward the red end of the spectrum, which might indicate velocities of recession up to a thousand miles a second. Now the cyanogen bands are characteristic not only of the cooler stars, but also of the comets and meteors; and Director Shapley and Miss Payne of Harvard suggest that the bands under discussion are due to cometary or meteoric material falling continually at high speed into the stars. They also suggest that the diffuse nebulosity seen around many bright stars is mainly meteoric rather than gaseous, and that eventually we may estimate the masses of stars from the velocities of the infalling matter, as shown by the displacement of the cyanogen bands. A number of other bits of evidence fit in well with this view; but calculation raises a doubt of the efficacy of reasonable amounts of meteoric matter to produce bands of the observed strength.

Arrangement of the Stars.—Even if our methods of observation were capable of finding the places and motions of all the stars, the labor would be prohibitive. The stars, like the molecules of a gas, must be studied by samples and treated statistically, if we are to investigate the gigantic system—or systems—of which they are members. And, in fact, the incapabilities of our observing methods limit our samples to the region of space comparatively near the sun, measures of *direction* and *magnitude* alone excepted. So our investigations of the farther reaches of space must depend on these measures. We measure the magnitudes of stars over sample regions in various directions, extrapolate the results over the sky, and then try to invent a reasonable stellar system that would give as nearly as possible the same apparent stellar distribution that our measures actually do give. Among those who have made notable studies of this kind is Dr. F. H. Seares of Mount Wilson. He has recently discussed the magnitudes found at Mount Wilson and at Groningen, Holland, for stars in Kapteyn's "Selected Areas" (or sample regions), with some additional material, and has made a very careful interpretation of the results.

The observed star-distribution has suggested to several investigators that there exist two systems of stars, rather than one: one flattened circular group, in shape not unlike a very thick soda-cracker, its center quite near the sun; and another even more flattened, whose center seems to be a great distance away in the direction of Scorpius and Sagittarius. The near, bright, blue stars (the Gould-Charlier system) belong to the first group; the Milky Way star-clouds, to the second. The two groups interpenetrate, and earlier investiga-

tors were inclined to consider them one, but modern studies, particularly Shapley's, have pretty clearly distinguished between them. Seares' present study brings out the contrasting features of the two groups, and the impossibility of representing his material by any simple one-group theory. Among his more striking conclusions are the unusually large proportions he assigns to the "local system"—an equatorial diameter of some twenty thousand light-years, a polar diameter one-third as great, a three-fourths majority of the stars near the sun, and a total membership of many million stars—and the lack of symmetry he finds for the other, "Milky Way system," in which the stars seem to be most closely crowded at a point nowhere near the system's center. He suggests that this asymmetry may be apparent only, due to obscuring clouds between us and the true center, and points out that a spiral nebula, seen from a suitably chosen point between its center and edge, would probably appear rather like this system, and that even its co-existence with the "local system" has a rough analogue in the spiral *Messier 51*, with its great secondary condensation. The boundaries of the "Milky Way system" are far beyond the reach of Seares' analysis, but his findings are entirely compatible with the diameter of more than one hundred thousand light-years, which has been estimated from other considerations.

BIBLIOGRAPHY

Astronomy, by E. A. Fath. Second Edition. (New York, McGraw-Hill, 1928.) A new edition of a popular textbook.

A Photographic Atlas of Selected Regions of the Milky Way, by E. E. Barnard. Two Volumes. (Washington, Carnegie Institution, 1927.) Magnificent reproductions of Barnard's unequaled photographs, with explanatory charts and catalogues.

A Source Book in Astronomy, by Shapley and Howarth. (New York, McGraw-Hill, 1928.) Presenting "the most significant passages from the works of the most important contributors to astronomy from Copernicus to Percival Lowell."

The Two Solar Families: The Sun's Children, by T. C. Chamberlin. (Chicago, University of Chicago Press, 1928.) Restatement and extension of the Planetesimal Hypothesis of the origin of the solar system, completed just before the author's death.

American observatories either maintain publications of their own, or publish their researches in such technical journals as *The Astronomical Journal* and *The Astrophysical Journal;* but summaries of their work appear each year in *Popular Astronomy* (Northfield, Minn.), which prints also abstracts of the papers read before the American Astronomical Society, and reports of the amateur organizations. Pacific coast observatories and organizations publish also in the *Publications of the Astronomical Society of the Pacific* (San Francisco), and Canadian, in the *Journal of the Royal Astronomical Society of Canada* (Toronto).

COGNATE SOCIETIES

American Association for the Advancement of Science.—Smithsonian Institution Bldg., Washington, D. C.

American Astronomical Society.—Washburn Observatory, Madison, Wis.

American Mathematical Society.—501 W. 116th St., New York City, N. Y.

Mathematical Association of America.—Oberlin, O.

National Academy of Sciences.—B. and 21st Sts., Washington, D. C.

Science Service.—21st & B. Sts., Washington, D. C.

DIVISION XIX

ENGINEERING AND CONSTRUCTION

STRUCTURAL ENGINEERING

By Milo Smith Ketchum

Dean of the College of Engineering, University of Illinois

SUSPENSION BRIDGES

Construction Revival.—The building of the Philadelphia-Camden bridge with a span of 1750 ft., the great Hudson River bridge with a span of 3500 ft., and the Detroit River bridge with a span of 1850 ft., marks the revival of the building of suspension bridges in the United States. In addition, there are the mid-Hudson bridge with a span of 1500 ft. at Poughkeepsie, N. Y., the Mount Hope bridge with a span of 1200 ft. near Providence, R. I., and four structures in the midwest with spans of approximately 700 ft.

Structural Details.—Progress has been made in the structural details on recent suspension bridges. On the Bear Mountain bridge cables were placed outside the stiffening trusses; heat-treated eyebar chains were used on the Florianapolis bridge in Brazil. New methods of wrapping cables were used on the Philadelphia-Camden bridge; at Mount Hope and at Detroit new methods have been devised for splicing cables.

Tolls.—The increase in the number of long span highway bridges is mainly due to the increase in highway traffic and the development of methods of financing toll bridges. There were so many applications for approval of toll bridges by Congress that the U. S. Bureau of Public Roads was asked to make a survey of toll bridges for the Committee on Roads, House of Representatives, Seventieth Congress. On October 7, 1927, there were 233 toll bridges operating in the United States; 29 toll bridges were under construction and 55 had been approved by the Sixty-ninth Congress. In addition, 67 were approved by the Seventieth Congress and 78 other toll bridges are definitely planned. This makes a total of 462 toll bridges in operation, under construction and definitely planned. Of the 233 toll bridges in operation on October 1, 1927, 42 were owned by the public and 191 were privately owned; 154 were owned by toll bridge companies and 37 by railroad companies.

Detroit Suspension Bridge.—The length of the Detroit suspension bridge is 7400 ft. The main span is of wire cable suspension type with unloaded back stays, and is 1850 ft. center to center of main piers. This bridge has a span 100 ft. longer than the Philadelphia-Camden bridge, and will be exceeded only by the 3500-ft. span Hudson River bridge. It will be known as the "Ambassador Bridge." The roadway is 47 ft. wide, with five traffic lanes. There is a single 8-ft. sidewalk. The vertical clearance required is 135 ft. near the shore and 152 ft. in the center.

The design loads are; main span floorbeams, a 24-ton truck and with main span floorbeams and suspenders, eight 21-ton trucks. For approaches —series of trucks, four abreast; if one row, 24 tons each; if two rows, 21 tons each; if four rows, 15 tons each; if five or more rows, 12 tons each or 100 lb. per sq. ft. Main span cables, towers, stiffening trusses and anchorages; normal load, 1650 lb. per lineal foot (about 30 lb. per sq. ft.), congested load, 3300 lb. per lineal

foot (about 60 lb. per sq. ft.). Impact, 30 per cent for main cables, towers, stiffening trusses and anchorages. Loading combinations for main cables, towers, stiffening trusses and anchorages: (1) dead load plus 40 lb. wind load; (2) dead load plus normal live load, plus 20 lb. wind load and 60 degree temperature stresses; (3) dead load plus congested live load and 60 degree temperature stresses.

Working stresses are carbon steel on 18,000 lb. per sq. in. basis, and silicon steel on 24,000 lb. per sq. in. basis. Each main pier consists of two hollow cylindrical concrete caissons, with 10 ft. walls and 18-ft. shaft, making the external diameter 38 ft. These piers are 94 ft. high, above which the concrete piers are 29 ft. in diameter and 20 ft. high, making the total height of the piers 114 ft. Each pier carries about 20,000 tons and rests on solid rock.

Each anchorage comprises: (1) A pair of vertical caissons centered under the cables, 22½ ft. in transverse width, 100 ft. in length parallel to the bridge cables and sunk into bed rock about 100 ft. below the river level; and (2) a cross-block of concrete 50 ft. from front to rear, 36 ft. deep and 97 ft. transversely with provision in it for embedment of anchorage eyebars, and grillage placed above and spanning transversely the rear ends of the horizontal caissons. The distance from the piers to the anchorages on the Canadian side is covered by five 152-ft. deck spans and a 30-ft. bracing tower, while on the United States side there are six spans varying from 121 ft. to 196 ft. with a 26 ft. bracing tower, with a total length of 953 ft.

Each main tower is composed of two columns 67 ft. apart with cross bracing and a height from masonry to cables of 363 ft. A column is comprised of three nearly square cells of silicon steel. The bracing of the towers is carbon steel. The central cell is continuous in dimensions from base slab to saddle casting, with 58-in. longitudinal webs and 72-in. transverse webs. All angles are 8 x 8 x ¾ in., and plates are 1½ in. in two thicknesses of ¾ in. each. The side cells have longitudinal webs 54 in. wide for the lower two-thirds of their height, above which they taper to 18 in. under the saddle castings. The towers are of the "semi-fixed" type. This type of tower was possible because the deck shore spans were available to support the towers during the placing of the cables.

The two main cables are each composed of 37 strands of 206 No. 6 galvanized wires. The wires are heat treated with a minimum yield of 190,000 in the place of 144,000 lb. per sq. in., and a minimum tensile strength of 220,000 in the place of 215,000 lb. per sq. in. as was specified for the Philadelphia-Camden bridge. The working stress was 84,000 in place of 76,000 lb. per sq. in. as was used with the Philadelphia-Camden bridge. Each cable in this bridge has 7622 wires while each cable of the Philadelphia-Camden bridge has 18,666 wires. The suspender arrangement is of the usual type.

The stiffening truss has a panel length of 24 ft. 2⅜ in. and a truss depth of 22 ft., omitting overhead bracing and staying the chords by floorbeam brackets. The floorbeams are plate girders of carbon steel. The floor is a 6-in. concrete slab with a 2½ in. covering of sheet asphalt, and is carried on stringers spaced 4 ft. 8 in. The stiffening truss chords are of silicon steel, while the webs are of carbon steel. The allowable stresses were 32,000 lb. per sq. in. for silicon steel and 24,000 lb. per sq. in. for carbon steel.

The McClintic-Marshall Company, Pittsburgh, Pa., is the engineer for the design of the bridge as well as the general contractor.

Mount Hope Suspension Bridge.— This wire-cable suspension bridge, across Mount Hope Bay in Rhode Island, has a 1200-ft. main suspended span, two 504-ft. suspended spans, and steel viaduct approaches totaling 2802 ft. The structure is 5010 ft. long. The main span cable has a 120-ft. sag, and provides a vertical clearance of 135 ft. for a width of 400 ft. The structure is founded on clay and gravel strata from 38 ft.

to 60 ft. deep. The bridge has a 27-ft. roadway on the suspended spans. The floor system was designed for three lines of 20-ton trucks spaced 33 ft. centers, plus 30 to 37 per cent impact; for the trusses and girder spans, three lines of 15-ton trucks spaced 33 ft. centers with allowance for impact. The towers are of the "fixed base flexible type" and reach 284 ft. above mean low water. Each tower post is cellular with eight compartments.

The anchorages are of concrete with sand-filled chambers. The chain anchorage which is 80 ft. long terminates in three box girders solidly built into the anchorage. There are two 11-in. wire cables spaced 34 ft. apart, each consisting of seven strands of 350 wires of no. 6 heat treated galvanized wire, providing a total cross-section of 74 sq. in. Heat treated wire is being used for the first time in a suspension bridge. The elastic limit of the heat treated wire is 190,000 in place of 144,000 lb. per sq. in. in untreated wire. The stiffening trusses are 18 ft. deep and are discontinuous at the towers. The chords are made of silicon steel with working stresses of 34,000 lb. per sq. in. in tension and 28,000 lb. per sq. in. in compression. The other structural members are made of carbon steel with working stresses of 26,000 lb. per sq. in. in tension and 21,000 lb. per sq. in. in compression. The floorbeam panels are 19 ft. 2 in. Floorbeams are 60 in. deep and carry wind bracing which is transmitted to the trusses by knee braces. The estimated cost of this bridge was $6,000,000. The bridge will be operated as a toll bridge. The contract calls for the completion of the bridge on July 1, 1929.

CANTILEVER AND ARCH BRIDGES

The Grand Canyon of the Colorado has recently been bridged by a three-hinged arch steel highway bridge with a span of 618 ft. center to center of end pins. The crown of the arch is 467 feet above the Colorado River. The bridge is located in Arizona 130 miles due north of Flagstaff, Arizona, the nearest railway station, and is 6 miles from Lee's Ferry, which it will eliminate. The arch has a rise of 90 ft. center to center. The bridge has an 18 ft. roadway. The panels are 28 ft. long. The bridge was designed for a live load of 60 lb. per sq. ft. The floor system was designed for one 15-ton truck or two 12½-ton trucks side by side. The floor is of reinforced concrete. This bridge was completed in September, 1928.

The Snake River Canyon has recently been bridged by a steel highway bridge located about 3 miles north of Twin Falls, Idaho. The bridge is a cantilever with anchor and cantilever spans of 225 ft., a suspended span of 250 ft., and 100 ft. tower spans. The total length of the bridge is 1350 ft. The clear span of the bridge is 700 ft. The roadway is 476 ft. above ordinary water level and 502 ft. above low water level. The clear roadway is 27 ft. and is supported on trusses spaced 32 ft. on centers. The bridge floor is of laminated timber 6 in. thick carried on 18 in. steel stringers. The wearing surface of the floor is asphalt. The structure was designed for a uniform load varying from 1,700 to 1,200 lb. per lineal foot of bridge. The floor system was designed for two 25-ton trucks either abreast or moving in opposite directions. An impact increment of 20 per cent was added to the stresses in the floor systems. The bridge is owned and will be operated under a 50 year franchise by the Union Bridge Company of Seattle, Washington.

Eads Bridge.—A board of engineers has recently reported that the Eads bridge over the Mississippi River is safe both as to condition of metal and as to strength to carry modern loading. This bridge was opened to traffic on July 4, 1874, and has therefore seen a service of more than 54 years. The bridge has two arch spans with a span of 502 ft. and one arch span with a span of 520 ft., carried on four masonry piers sunk to bed rock. The bridge carries a double track railway on the lower deck and a highway with a double track electric railway on the upper deck. The arch ribs are made of chrome steel, while the diagonals

and web members are made of wrought iron. The steel and iron work has been well cared for and is in excellent condition.

BRIDGE MATERIALS

High Strength Steels.—As the span of the bridge increases the ratio of the dead load to the live load rapidly increases. In the new Hudson River bridge with a span of 3500 ft. the ratio of dead load to live load is five to one. For bridge spans of moderate length carbon steel is quite satisfactory, but for long span bridges it is desirable both for strength and economy to have high strength steel which gives greater strength with less dead load.

Chrome Steel.—Eads used chrome steel with an ultimate strength of 100,000 to 130,000 lb. per sq. in. and an elastic limit of 56,000 to 77,000 lb. per sq. in., in the arches of the Eads bridge built over the Mississippi River in 1874.

Nickel steel was used in the eyebars of the Queensboro bridge, New York City, in 1902. The eyebars were specified to have an ultimate strength of 85,000 lb. per sq. in. and an elastic limit of 48,000 lb. per sq. in. Nickel steel was used for the chords and web members in the design of the Manhattan Bridge in 1906. Nickel steel was used for 25 per cent of the steel used in the Quebec Bridge. Nickel steel was used for the eyebars and the compression members of the Municipal bridge at St. Louis. The stiffening trusses of the Philadelphia-Camden bridge were made of nickel steel. Mayari steel, a natural alloy of nickel-chromium steel made from ore mined in Cuba, was used in the Harahan bridge at Memphis, Tennessee.

Silicon steel was first used in a bridge in 1915 in the Metropolis bridge over the Ohio river. The required ultimate strength was from 80,000 to 95,000 lb. per sq. in. and the elastic limit was 45,000 lb. per sq. in. Silicon steel was used in the Cincinnati bridge in 1917, and to a large extent in the Philadelphia-Camden and Carquinez bridges. Nearly 32,000 tons of silicon steel will be used in the new Hudson River bridge.

Heat-treated carbon steel introduced in 1916 is now available in two grades with an ultimate strength of 80,000 and 105,000 lb. per sq. in., an elastic limit of 50,000 and 80,000 lb. per sq. in., and an elongation in 18 ft. of 8 per cent and 5 per cent respectively. About 1400 tons of bars of the lower grade were used in the Carquinez bridge, and 800 tons of the higher grade bars were used in the Florianapolis bridge in Brazil.

Wire for Suspension Bridges.—The ultimate strength of the steel wire used in the Brooklyn Bridge in 1880 was 160,000 lb. per sq. in. and in the Philadelphia-Camden Bridge 215,000 lb. per sq. in. The ultimate strength of the steel wire in the Hudson River Bridge is to be 220,000 lb. per sq. in. Heat treated steel wire is being used in the new Detroit suspension bridge with an ultimate strength of 220,000 lb. per sq. in., but with an elastic limit of 84,000 in the place of 76,000 lb. per sq. in. for the untreated wire.

Concrete.—A long reinforced concrete highway trestle bridge across Lake Pontchartrain, Louisiana, was completed in 1927. The bridge consists of 700 spans of 35-ft. span reinforced concrete spans, and two steel draw spans with a total length of 427 ft., making the total length of the bridge 4.27 miles. The main structure consists of a concrete deck with railings, in 35-ft. spans on capped four pile concrete piles, all heavily reinforced. There was approximately 3 cu. yd. of concrete and 775 lb. of steel reinforcement for each lineal foot of bridge. The piles were precast on the shore, taken to the site on barges, and driven by standard pile drivers. There were 2796 piles, with an average length of 76 ft. and an average weight of 20 tons.

BUILDINGS

World's Tallest Building.—The general contract has been let for the 68-story Chrysler Building to be built on Lexington Avenue between Forty-second and Forty-third Streets, New York City. The total height will

be 808 ft., 18 ft. more than the Woolworth Building. The estimated cost is $14,000,000.

World's Largest Building.—The Merchandise Mart in Chicago, for which contracts have just been let, will be the largest building in the world. It has a frontage of 724 ft. on Kinzie Street, 577 ft. on the Chicago River, 324 ft. on Wells Street, and a diagonal frontage on Franklin and Orleans Streets. The building is set back 80 ft. from the Chicago River to provide for a future two-level drive. It is 18 stories in height, has 280,000 sq. ft. on each floor, and a total of 4,000,000 sq. ft. in the main structure. The estimated cost is $30,000,000.

Tallest Concrete Building.—The 18-story Master Printers Building in New York is the tallest concrete building in America. The building has a ground plan of 197.5 ft. by 175 ft., is 301 ft. high and has a floor area of 550,000 sq. ft. It was designed for occupancy by printers and allied trades and is of heavy construction. It is of flat slab floor construction. The floors are designed for a live load of 250 lb. per sq. ft. Steel columns are used for the ten lower floors and the basements. The columns are spaced 18 ft. 9 in. by 19 ft. 9 in. and the floor slabs are with monolithic finish. The basement story height is 13 ft. 6 in., the first story height is 18 ft., and typical story heights are 13 ft. 6 in. The building is set back beginning at the eleventh floor.

MATERIALS AND DESIGN

Steel Columns in Concrete Buildings.—One objection to high reinforced concrete buildings has been due to the large size of the reinforced concrete columns in the lower floors. Structural steel cores have recently been used in the lower six floors of the 22-story reinforced concrete apartment building known as the 1400 Lake Shore Drive Apartment in Chicago, and in the lower seven floors of the 12-story reinforced concrete Uppercu Building in New York. The steel core columns in both buildings are H sections from 12 in. to 14 in. deep. The steel columns are two stories high in the Chicago building and are spliced at the fourth floor in the New York building. The floors and girders are carried on brackets. The upper concrete columns are carried on steel slabs resting on the tops of the steel columns.

Design for Wind Pressures.—The Florida and Porto Rico tornadoes have emphasized the value of well designed structures in resisting wind pressure. A study of the Florida storm shows that there was small damage to well designed and well constructed buildings. The lesson from the 1926 and 1928 tornadoes is that a structure designed to resist a wind pressure of 30 lb. per sq. ft., is well braced, has the roof anchored to the walls and the walls anchored to substantial foundations, there will be little structural damage in a tornado.

Earthquake Resistance.—Very definite progress is being made in the design of structures to resist earthquakes. Earthquake movements are of three kinds: (1) Vertical movements, (2) longitudinal movements, and (3) transverse movements. The vertical movements come first, and while appearing violent to persons, produce very little effect on buildings. The longitudinal movements are very destructive and wreck improperly designed buildings due to the intensity of the movements and the fact that they act in a direction not considered in ordinary design which provides for vertical loads only. The transverse movements are felt last and are usually only tremors. The longitudinal movements or waves are of varying intensity depending upon the severity of the disturbance.

Henry D. Dewell, consulting engineer, in the *Engineering News Record*, April 20, 1928, states: "It would seem that for American conditions, in the case of buildings on firm soil at a distance of several miles from the nearest fault-plane likely to be active, the value of one-tenth of gravity, or 3.2 ft. per sec. as a design acceleration is a reasonable maximum." An increase of 50 per cent of the unit stresses due to dead and live load may be used where stresses due to earthquake are considered.

Two methods for the design of buildings for resistance to earthquakes may be used. The first method is to design the building and its foundations so that the energy of the shock will not be transmitted to the mass of the building. The second method is to design the building and its foundations to resist the full force of the earthquake. The first method with "free foundations" has been used in the design of several small buildings and lighthouses in Japan. This condition may be approximated by using long unbraced columns for the lower story, and by keeping the basement columns and walls free from contact with all retaining walls. The second method with "rigid foundations" is the usual type of building in which the foundations and the superstructure are tied together.

In designing buildings to resist earthquakes the following essentials are applicable to all types of buildings. The best location for a structure is at a considerable distance from a fault plane, on hard rock or firm, deep soil with level surface. The building should preferably have a rectangular plan. Buildings with irregular plan or reëntrant angles in the plan may have the different parts act with different vibration periods, resulting in large stresses between the parts. Buildings of irregular plan should have the parts well tied together, or the parts of the buildings should be separated a sufficient distance to permit the parts of the building to vibrate freely. Deep foundations are an asset. The parts of the foundation should be tied together. High soil pressures should be avoided; however, a soil with a high bearing capacity is an asset.

The building and foundations should be kept free of the surface as deep as practicable, for the reason that the maximum longitudinal effects are near the surface. The superstructure should be well braced, especially in the walls, at the corners and around openings. Rigidity is absolutely essential in the structure. While weight is a desirable feature to resist wind stresses, the earthquake stresses increase with the weight of the structure. For buildings of moderate height, properly designed reinforced concrete buildings will furnish adequate resistance to earthquake shock. For tall buildings, the structural steel frame has the advantages of less weight, and greater rigidity than a reinforced building of the same height.

Design By Law in California.—Santa Barbara, Palo Alto, and San Francisco have building laws containing provisions for the design of buildings against earthquake shock. The following abstract of the San Francisco laws will show methods used in design to resist earthquake shock. All framed buildings shall be designed to resist (1) the lateral stresses due to a lateral or "wind load," or (2) due to a lateral horizontal force applied at the center of gravity of the structure. The structure is to be designed for the maximum stresses found by the two methods. The lateral, or "wind load," and the lateral force applied at the center of gravity shall vary with character of the foundation. Where a safe load of 4 tons per sq. ft. is permitted on the foundation, the lateral or "wind load" shall be taken at 20 lb. per sq. ft., and the horizontal force applied at the center of gravity shall be taken at 10 per cent of the weight on the columns. Where a safe load of 3 tons per sq. ft. is permitted on the foundation, the lateral or "wind load" shall be taken at 30 lb. per sq. ft., and the horizontal force applied at the center of gravity shall be taken at 15 per cent of the weight on the columns. Where a safe load of 2 tons per sq. ft. is permitted on the foundation, the lateral or "wind load" shall be taken as 45 lb. per sq. ft., and the horizontal force applied at the center of gravity shall be taken at 20 per cent of the weight on the columns.

PIERS AND FOUNDATIONS

Deep Cofferdam for Bridge Piers.—The piers for the New Jersey tower of the Hudson River Bridge have been constructed by means of deep cofferdams of novel design, and unprecedented depth. The cofferdams had in-

side dimensions of 98½ ft. by 109 ft., and a depth below mean sea level of 65 ft. and 75 ft., and required steel sheet piles 79 ft. and 85 ft. long. The east or out-shore ends and four-fifths of both adjacent sides were formed by two lines of steel sheet piles 7 ft. 10½ in. apart connected by diaphragm walls 10 ft. 6 in. apart. The sheet piles weighed 32.9 lb. per ft. and varied in lengths from 35 ft. to 85 ft. The walls of the cofferdams were braced by timber longitudinal and transverse struts, spaced about 18 ft. apart. The struts abutted against outside waling or rangers consisting of 24-in. and 30-in. steel I-beams. The struts varied from 6 in. by 12 in. at the top to 10 in. by 14 in. at the bottom.

There were four horizontal frames and two additional inclined frames to reduce the stresses in the lower struts. The struts were designed for the hydrostatic fluid pressure, the influence of mud and silt being disregarded. The water depth at the side was 15 ft. below mean sea level. Overlying the rock was 4 or 5 ft. of shells and sand, and above this was a layer ranging from stiff clay at the bottom to silt at the top. Each cofferdam was unwatered by means of one 12-in. and one 8-in. vertical submerged centrifugal pump. When each dam was unwatered a 4-in. horizontal centrifugal pump running at intervals took care of the seepage. It was intended to fill the outside pockets in the steel sheet piles with a mixture of sand and river mud. It was found necessary to place concrete in pockets along the east or out-shore wall and also in four adjacent pockets along the north and south walls.

Two minor blows occurred in the south cofferdam; these were remedied by sandbags and cinders in the water outside and directly above the blow. A serious blow occurred under the single steel sheet piles on the north of the north cofferdam. The steel sheet piles were driven into a depression in the rock, and penetrated the firm red shale for more than a foot. After unwatering the cofferdam the shale gave way and the steel piles were bent inward. Of the five men at work in the cofferdam, three were killed. Pile-driving was started July 31, 1927, and the piers were completed on April 27, 1928. The open cofferdam method was much more satisfactory than the pneumatic caisson method at a much less cost. The piers for the Arlington Bridge, Washington, D. C., were constructed by the use of similar steel cofferdams, with a depth of about 50 ft.

Deep Building Foundations.—The foundations for the new Union Terminal Building at Cleveland, Ohio, have been sunk to the unprecedented depth of 260 ft. below the curb. The area of the building, 260 by 300 ft., was excavated by means of steam shovels to a depth of 52 ft. below the curb. The main pit was drained by four gasoline-driven pumps and the wells for 87 main concrete piers were sunk by the open well method. The wells were sunk to ground water level using timber sheet piles, and below this point by means of steel sheet piles to a body of plastic clay. The wells were sunk through the plastic clay by means of the Chicago deep well method, using wood staves in a circular barrel. The water was pumped from the open wells by means of two 3-in. centrifugal pumps operated by two 10-h.p. motors. The pumps had a maximum lift of 133 ft., making it necessary to use the pumps in series for the deep wells. Some difficulty was encountered with the gas which entered the deep wells. This gas was diluted by delivering fresh air at the bottom of the wells. The cylindrical wooden stave sheeting was left in place to serve as forms for the concrete piers which varied from 4½ to 10 ft. in diameter.

STRUCTURAL WELDING

Welded Buildings.—More than 50 welded buildings have been constructed without a single failure. A 12-story hotel in which the connections of the steel frame have been welded has recently been completed at Hot Springs, Va. While there is a saving in material in a welded over a riveted structure, the cost of fabrication and erection of the welded structure is commonly more than for the riveted

structure. The assistant operating manager of the American Bridge Company is quoted as saying that "as far as shop fabrication of welded structural steel is concerned, higher rental costs militate against it." He said that it takes considerably longer to weld a 90-ft. girder than to rivet one. The American Welding Society has a committee at work on a standard building code to use as a master code for use in revising the building code of cities.

Arc-Welded Truss Bridge.—A railroad bridge with welded connections has been placed in service during the present year over a canal between Westinghouse Electric and Manufacturing Company's plant at Chicopee Falls, Mass., and the Boston & Maine Railroad. It is a single track bridge with a skew of 72 degrees and a span of 134 ft. 8 in. It was designed for an E 50 loading with about one-half the allowance made for impact in bridges on main lines. The bridge was designed to adapt the construction to the use of welded joints. All joints are arc-welded, no rivets were used although field bolts were used in erection. There was a considerable saving in weight of steel over a design with riveted connections; the lowest bid for the welded bridge was $15,000 as compared with $19,000 for the alternate design.

After a week of service one of the butt welds at a lower chord splice cracked and had to be replaced. The crack was said to have been due to initial cooling tension. The weld which failed joined the webs of two members, after the flanges on both sides had been welded solid, thus making it impossible for the welded member to adjust itself when cooling. This accident emphasizes the complexity of structural design and shows that much research and experience will be necessary before welding may be generally adopted for riveting in large steel structures carrying heavy loads.

THE CASCADE TUNNEL

The 7¾ mile Cascade tunnel on the Great Northern Railway will be completed before the end of the year. The contract for the tunnel was made December, 1925, and on August 31, 1928, the main tunnel was completed to full sections for 7 miles and the concrete lining was placed for 6 miles. This tunnel replaces the old tunnel 13,873 ft. long. The new line will shorten the distance 7.67 miles and will eliminate nearly 6 miles of curvature. The tunnel is on a 1.53 per cent grade. By crossing the range at a lower elevation the new line will eliminate most of the snow trouble.

The tunnel is a single bore with a finished section 16 ft. wide and a height of 22 ft. above the rail. From the west end a pioneer tunnel 9 ft. wide and 8 ft. high was driven 66 ft. from the main tunnel. From cross cuts from the pioneer tunnel, 10 ft. by 10 ft., center headings were driven on the main tunnel, the center headings being later enlarged to the 18 ft. by 24 ft. section. On the east end no pioneer tunnel was used for a distance of 2½ miles. The estimated cost of the tunnel was $10,000,000. The railroad will be operated by electricity through the tunnel.

CONCRETE DAMS

St. Francis Dam Failure.—The St. Francis dam of the Los Angeles aqueduct collapsed during the night of March 12, 1928, resulting in the loss of several hundreds of lives and a great loss of property. It was a concrete structure of the gravity type, and was arched in plan. The dam had a maximum height of 205 ft., and a base width of 176 ft.; the curve of the dam in plan had a radius of 500 ft. The foundation pressures at the toe were limited to 10 tons and at the heel to 12 tons per sq. ft. The dam was designed for hydrostatic uplift. It appeared to have failed near both ends at nearly the same time, sweeping the mass of the structure down stream with the exception of a section about 100 ft. long near the center which remained approximately in position. The force of the water washed out parts of the foundation below the level of the foundations of the concrete dam.

The reports of three committees of

engineers and geologists appointed to investigate the failure agree in the main upon the causes. The following conclusions may be drawn from these reports: (1) The failure of the dam was due to defective foundations. (2) The dam was constructed without a sufficiently thorough examination of the foundation materials upon which it was constructed. (3) There is nothing in the failure of the St. Francis dam that would indicate that the accepted theory for the design of gravity dams is in error, nor is there any question about the safety of high concrete dams designed in accordance with that theory when built upon sound rock foundations. (4) The failure of the St. Francis dam emphasizes the importance of having the plans and the site checked by competent engineers and of the importance of careful supervision of construction.

Lancha Plana Gravity Dam.—The Lancha Plana dam built on the Mokelumme River near Lancha Plana, Calif., is a concrete dam of the gravity type. The maximum height is 360 ft. above the foundation and the width at the base is 245.8 ft. It is built on a curve with a radius of 1,200 ft. The dam was designed to meet the following requirements: (1) The pressure line at any level shall not depart from the vertical by more than 0.75 slope; (2) the maximum stresses in the dam and the foundations shall not exceed 500 lb. per sq. in.; (3) the variation of pressure on the foundation was taken as rectilinear; (4) masonry was assumed to weigh 150 lb. per cu. ft.; and (5) when foundation stresses are calculated on the assumption of a vertical slice of the dam between parallel planes, the uplift on any horizontal section shall be taken as zero at the toe and 25 per cent of the hydrostatic uplift at the heel, while for a vertical slice between radial planes the uplift shall be taken at 10 per cent at the heel and at 25 per cent at the toe of the hydrostatic head. The dam will contain 640,000 cu. yd. of concrete. The original plans called for a concrete arch dam, but when the foundation was excavated it was found that the site was not suitable for an arch dam and the design was changed to a gravity dam.

Owyhee Gravity Dam.—The Bureau of Reclamation has completed plans for a high concrete dam on the Owyhee reclamation project embracing 120,000 acres in eastern Oregon and western Idaho. The dam is of the combination arch and gravity type. It will be 390 ft. high above the general elevation of the foundation, 405 ft. high at the maximum section, and 520 ft. high above the lowest concrete in the foundation cutoff. Preliminary designs and estimates were prepared for five different alternative types: (1) A light arch section, (2) an intermediate arch section, (3) a heavy arch or arch and gravity section, (4) a straight gravity dam, and (5) a slightly curved gravity dam.

The heavy arch type was virtually a gravity dam curved in plan, and if straight and not subject to uplift would be safe as a gravity dam. In its curved form the loads are carried partly by gravity and partly by arch action. The two lighter arch sections (1) and (2) were designed to carry the loads partly by arch action and partly by gravity action, while the straight gravity and curved gravity were designed strictly as gravity dams. Uplift pressures were assumed to act over the whole area of the base, varying from full hydrostatic pressure at the upstream face to one-half pressure at the drainage wells, and to zero or tail water pressure at the downstream face. The comparison showed the arch-and-gravity type of dam to be the most efficient and it was adopted. The dam has a maximum bottom thickness of 264.5 ft. and a top thickness of 30 ft. The upstream face has a batter of 0.05: 1 and the downstream face has a batter of 0.625: 1. Engineering investigations for this dam covered three years' time and cost nearly $100,000. The investigations included the drilling of 73 test holes with an average depth of 107 ft., five different geological examinations of the site, and a report by a board of consulting engineers.

Coolidge Multiple-Dome Dam.—

The Coolidge dam recently completed on the Gila River in Arizona is the first multiple-dome dam ever built. The dam consists of three reinforced concrete domes, each 251 ft. high and 181 ft. wide, and is constructed without expansion joints. Plans and estimates were made of six different types of dam with the following relative costs: (1) Multiple dome, 100 per cent; (2) multiple-arch, 102 per cent; (3) variable-radius arch dam, 112 per cent; (4) arched-gravity, no uplift, 120 per cent; (5) rock-fill dam, 135 per cent; (6) arched-gravity, 50 per cent uplift, 140 per cent. It should be noted that the unit stresses in the variable-radius arch dam would greatly exceed those in the domes. In fact at this dam site the width of the canyon was so great that it made a variable-radius arch dam impracticable. There was little difference in cost between the multiple-arch dam and multiple-dome dam but the latter requires 50 per cent more concrete than the former with similar unit stresses for about the same cost.

The multiple-dome dam is particularly adapted to wide canyons where good foundations are available, and the dam height is to exceed 200 ft. The buttresses between the domes are made massive and increase in thickness from below the domes to the foundation. The thickness of the concrete in the buttresses and domes protects the steel and prevents temperature cracks. Each dome is designed as a series of horizontal arches and is assumed to carry the water load which varies as the depth. In the calculations each dome is assumed to be composed of a number of independent arches normal to the spring line, no account being taken of the strengthening effect of the dome. The shape of the dome does away with cantilever stresses and thus eliminates the objectionable tension stresses.

The stresses in the domes due to hydraulic thrust, temperature, and dead load are all in compression except for a small area near the base where there are forces producing tensile stresses of 40 lb. per sq. in. The maximum compression stresses in the domes are about 586 lb. per sq. in., and in the buttresses 400 lb. per sq. in. The maximum pressure on the buttress foundations is 20 ton per sq. ft. No cracks have developed in the three domes up to September, 1928. The contract price for the dam was $2,268,000, exclusive of steel and cement, which were furnished by the Government. The dam contains 200,000 cu. yd. of concrete. The total cost of the dam and the power house will be about $4,500,000. The contract for the dam was signed January 1, 1927, to be completed July 1, 1929. The dam was completed nearly nine months ahead of the schedule.

CONCRETE CONSTRUCTION

Research.—The demand for early use of pavements and the rapid construction of buildings and other concrete structures has emphasized the great value of early strength concrete. For the most part reliance for early strength concrete has been placed on new early strength cements. Recent investigations made by the Connecticut State Highway Department have shown that early strength may be obtained with standard cement with proper proportions and field control. A study of the investigations shows that by increasing the percentage of cement, by changing the proportions from 1:2:3½ to 1:1½:2, decreasing the amount of mixing water, by increasing the time of mixing from 1¼ to 2½ minutes, and adding 2 per cent by weight of cement of calcium chloride, the strength of the concrete was increased 66 per cent at 48 hours and 20 per cent at 96 hours. If the mixing water were heated it is probable that the early strength of the concrete would be further increased.

In building concrete grain elevators with moving forms, where it is necessary to expose the concrete in 8 or 10 hours after it is placed in the forms, the following procedure is followed in mixing and placing the concrete: (1) use a properly proportioned aggregate to give a smooth working mixture with a minimum amount of mixing water; (2) use sufficient cement to make a smooth, rich mix with a small amount of

water; (3) heat the mixing water; (4) mix the concrete thoroughly in a batch mixer.

Tests of Concrete Bridge.—Tests of the reinforced concrete highway arch bridge over the Yadkin River between Albemarle and Mount Gilead, N. C., have been completed and the final report is ready for publication. The bridge consisted of three two-rib open spandrel arches of 146 ft. 3 in. clear span and 28 ft. 3 in. rise with seven 42 ft. 6 in. deck girder approach spans at each end. The bridge had a clear roadway of 18 ft. The piers were founded on solid rock. After the tests were completed on the bridge, the floor system and the supporting columns were removed and the arch was tested to check the elastic theory for the design of arch ribs.

The following conclusions may be drawn from these tests:

(1) The action of the reinforced concrete rib, when free from the restraining effect of the superstructure and supported by practically unmovable piers, conforms closely to the action as determined by the accepted theory of elastic structures.

(2) The observed compressive stresses check the calculated stresses more closely when it is assumed that the concrete takes tension as well as compression, even when the high tensile stresses will produce cracks at points of high stress.

(3) The stresses in the steel were less than when calculated by the elastic theory.

(4) The superstructure in an open-spandrel rib arch greatly reduces the deformation of the rib.

(5) Tests on a celluloid model with Beggs' gauges give quantitative results of great value in checking the calculated stresses.

(6) Temperature stresses in the rib appear to be independent of the superstructure for this particular arch.

Arch Dam Investigation.—Thin arch concrete dams have been built in locations where the dam is used to close a narrow canyon with side walls of solid rock. Thin arch dams carry the water pressure partly as elastic arches and partly by cantilever action. The thin arch dam is also subject to changes in temperature and moisture, and changes due to the setting and hardening of the concrete. With the knowledge available, it has not been possible to make an exact solution of the stresses in thin arch dams, but dams of this type have been designed by approximate methods. The best known approximate method of design has assumed that the water pressure is taken by arch action and cantilever action in such proportion as will make the deflection of the arches and cantilevers equal at each point in the arch.

Field tests have been completed and a preliminary report has recently been published by the American Society of Civil Engineers on the tests of the experimental thin arch concrete dam on Stevenson Creek in California. The tests were carried on by a committee of engineers, most of whom were members of the American Society of Civil Engineers, but working as a committee of Engineering Foundation. The arch was 60 ft. high and was 140 ft. long on the crest. The dam was 7½ ft. thick at the bottom and decreased to 2 ft. thick at 30 ft. in height; from there to the top it was 2 ft. thick. It was designed by means of the elastic arch-cantilever method referred to above by Fred A. Noetzli. The tests of the dam were carried on under the direct supervision of Professor W. A. Slater. A mathematical analysis of the thin concrete arch dam was made by Professor H. M. Westergaard. Tests have been made on celluloid models by Professor George E. Beggs. Tests are also being made on model concrete dams at the University of Colorado.

Tentative conclusions are as follows: (1) The tests have demonstrated the great strength of a thin, unreinforced concrete arch dam if well built on proper foundations. (2) The tests have yielded results that will make it possible to devise a satisfactory method for the design of thin arch dams. (3) The tests on the experimental dam and the mathematical analysis show quite a satisfactory agreement with the design stresses

calculated by the approximate elastic arch-cantilever method which was used in designing the arch. The work on the investigation is proceeding and the Committee expects to present a final report in the near future. The total cost of the investigation to date has been more than $115,000.

MECHANICAL ENGINEERING

By Calvin W. Rice

Secretary, American Society of Mechanical Engineers

and

By Leon Cammen

Associate Editor, *Mechanical Engineering*

INTRODUCTORY

Mechanical engineering has reached a stage where progress each year is inevitable simply because vast amounts of money are spent in the installation and operation of new equipment, and the manufacturing and operating work is so big that there is a well-justified incentive towards improvement. Some of this improvement takes place in what may be referred to as short steps or minor changes from the existing practice which represent, however, really substantial progress when considered in the aggregate. On the other hand, improvements are also made along radically new paths. There have not been many belonging to the latter class in the past year but there have been some. In the present report, use is made of progress reports presented by some of the professional divisions of the national engineering societies comprising the Advisory Board of The American Year Book.

POWER PLANT ENGINEERING

Plant Designing.—In this field, two radically different tendencies are observable. In the first place, in large power stations an effort is made to capture and set to work every thermal unit. Where formerly no attempt was made to utilize minor quantities of heat, nothing is allowed to escape now which can be put to work at a reasonable cost. This leads to increasing complication in the design of the power plant, such as air heating, steam reheating between stages, the introduction of the so-called steaming economizer, improvements in the operation of the condenser and above all improvement in the furnace design. Complicated designs of the last stages of the turbine make it possible to utilize the best condenser vacuum. All of this presents a complicated and at times somewhat confusing picture in the modern central station.

Simplifying Design.—This is one tendency, but the same problem has been attacked from another point of view—that of designing a very simple station free of most of the new appurtenances and relying exclusively on an extremely careful design of the basic constituents together with a carefully worked out scheme of operation and control. Examples of the former tendency are too numerous to mention; the latter is well represented by the Padiham central station in England. The surprising part about it is that approximately the same results are being obtained from the simple station as from those which are more complicated. This does not imply any condemnation of what might be called the ultra-modern type of design, and it might be added that Padiham station would have been impossible without the knowledge which most recent developments have produced.

Process Steam.—The world-wide increase in the cost of fuel has led to intensive study of the problem of steam generation where the power plant has also to deliver substantial quantities of steam for other purposes such as heating, cooking, boiling chemicals, etc., There are instances

in chemical plants, etc., where the importance of this so-called process steam exceeds that used for power generation. This problem has been studied with particular care in Germany and several combinations of reciprocating steam engines and turbines, including exhaust turbines, have been evolved.

Powdered Coal.—The progress in the use of powdered coal in the past 4 or 5 years has been tremendous. In 1924, the annual consumption of powdered coal was about 16,000,000 tons. Of this, only about 3,500,000 tons were consumed in generation of power. Today, the annual American totals exceed 25,000,000 tons, and the world totals 35,000,000 tons, the increase being principally due to the application of powdered coal for generation of power. It is estimated that there are today more than 1000 powdered coal installations and more than 2000 boilers so far. Reports by the Department of Commerce indicate a decrease in the sale of stokers.

One of the most interesting applications of powdered coal has been to marine steam generation. The United States Shipping Board was the leader in this field with the S.S. *Mercer* and this was followed by a British vessel, the *Stuartstar*, with the difference that the *Mercer* was completely equipped for powdered fuel while in the British vessel only one of four boilers had been so equipped. In both cases, the operation appears to have been eminently successful.

Vapor Plants.—In the previous issue (THE AMERICAN YEAR BOOK), reference was made to a system in which two kinds of vapor are used,—mercury and water. Since then, several other combinations of binary vapor plants have been suggested. An installation of a mercury vapor boiler was made some four years ago at Hartford, Conn., and has been so successful that a much larger unit is now being installed. It is claimed that the already remarkable record of 27% thermal efficiency obtained at the Columbia plant in Ohio with the steam cycle, could be increased to 36% if that plant were designed to operate on the mercury steam cycle. Steam bleeding is now accepted as standard practice. The 165,000 kw. unit at Philo will, under base load conditions, be bled at 5 points for feed water heating.

The Steam Turbine.—As regards the steam turbine, we have apparently reached the stage where turbines of any size that one is willing to pay for can be built. Single cylinder turbines of 75,000 kw. capacity, tandem compound turbines of 160,000 kw. capacity and cross-compound turbines of from 200,000 to 300,000 kw. capacity are available, and turbine manufacturers are perfectly willing to undertake and guarantee even bigger units. A tremendous advance has been made in the direction of higher steam pressure. When the first 1200 compound steam pressure boiler was ordered for the Weymouth plant of the Boston Edison Company, the general feeling among engineers was that there was no certainty that it would run, and even if it did most likely there would be no commercial advantage. It was actually found that even higher pressure, say up to 1400 pounds, per square inch gage and steam temperature up to 750 deg. fahr. are perfectly reliable and there is considerable evidence to indicate the likelihood of satisfactory operation at even higher temperatures.

Boiler Types.—What is more, quite a number of boiler types capable of giving steam at this pressure and temperature have been developed here and in Europe. Some of these boilers deserve particular mention. The Babcock and Wilcox Company developed what are known as drumless or series boilers, which means boilers which either have no steam or water drums at all or employ very small drums. The series boiler has not yet been tried out, however, at the top pressures now possible. Another very interesting type of boiler, to which reference has been made previously, is the Benson, in which water is evaporated at the critical pressure and temperature: this means the pressure and temperature at which the steam occupies exactly the same space as the water (roughly 3400 pounds pressure and 905 deg. fahr. temperature). A unit was built in Germany for an

output of about 10,000 pounds of steam per hour in 1926 and it proved to be so successful that another one has been erected now with a nominal capacity of about 55,000 pounds per hour. The remarkable part about it is that contrary to certain fears the plant, notwithstanding the very great pressure employed, proved to be remarkably safe and simple in operation and is, in fact, controlled either automatically or by push buttons from a control room located some distance away. Since little attention is required for the boiler, and the construction is such as to form a closed tower: a boiler house is superfluous, and the boiler appears as an isolated structure looking somewhat like a water tower.

Operation Designs.—One of the remarkable features of modern power plant engineering is the successful introduction of designs which make the operation of a power plant amazingly simple to handle. For example, the Avon Park Station of the Florida Public Service Company, a plant rated at 15,000 kw., can be actually operated by one man. All the equipment possible is located at one floor elevation, and equipment which can not be located on the operating floor is put in the basement but in such a manner that it can be observed from the operating floor. There are no dividing walls between boiler room, turbine room and switchbay. One other feature of such a plant deserves particular attention. Where turbines and electrical machinery are operated, a high degree of cleanliness has to be maintained, and the fact that the electrical department has direct connection without intervening walls with the boiler house shows that the kind of boiler house, which the average man thinks of as a place of dirt, grease and dust, has passed into the realms of history at least as far as the modern central station is concerned.

INTERNAL COMBUSTION ENGINEERING

Engine Types.—In the field of internal combusitno engineering today, tendencies are more important than actual mechanical progress. While changes of probably a radical nature will undoubtedly occur, it may be considered as definitely established that the present types of internal combustion engine, both of the explosion and of the diesel type, have reached a stage of development where they are fully capable to perform, in an efficient and reliable manner, all the things demanded of them. Such types as one may expect to see in the future will probably be even more flexible than those of today: they will probably be more economical in as far as fuel utilization is concerned and they will certainly be of less weight per unit of power developed. This last may be expected to be produced partly by better design of the engine itself and partly by the use of stronger materials which will unquestionably become available before long. On the other hand, however, in both fields of internal combustion engine, fairly well standardized designs have been adopted and large amounts of money have been invested in engine and vehicle manufacturing plants. The result is that improvements of a general character rather than improvements in minor details would have to be very important indeed before they could be adopted. This applies probably with even more force to explosion engines, particularly in the automotive field, than to diesel engines.

Engine and Fuel.—In explosion engines, many changes of design may be expected along the following lines: in the first place, more and more information is being accumulated about the relation between engine performance and fuel characteristics; the use of cracking produced types of fuel quite different from straight run or casinghead gasolines, while extensive work on detonation has given even more information on this subject. We know now that the so-called knocking or pinking in engines running on high compression cycles depends primarily on the character of the fuel but may be aggravated by certain features of design. Recent work has shown that fuels capable of very rapid and intensive oxida-

tion are particularly apt to develop knocking and this tendency to intensive oxidation is, in the first place, due to the structure of the fuel itself and, in the second place, may be inhibited by the employment of what has come to be known as "negative catalysts." It is, therefore, becoming a comparatively simple problem to design an engine to suit the given fuel or to build up a fuel such as would give the maximum of performance from a given engine design.

New Engine Materials.—The other serious limitation of explosion engines,—namelly, rapid destruction of certain elements exposed to the flame, is likewise rapidly being overcome by the use of new materials. Failure of spark plug porcelains has been reduced by the employment of such super refractories as mullite and now the other bugbear of engine design, the burning out of exhaust valves, is being rapidly overcome by making these valves of chromium base alloy, with or without silicon.

DIESEL ENGINES

Powdered Coal Experiment. — Diesel engine building is being carried on now on such a scale that a considerable amount of standardization has become inevitable. One of the most interesting developments, from an engineering point of view, is the attempt made by Pawklikowski in Germany to run a diesel engine on powdered coal. This is all the more interesting as the original idea of Dr. Rudolph Diesel was to build, not an oil, but a powdered coal engine. Pawklikowski succeeded in running his engine for a number of months without any great trouble. Whether or not such an engine will be able to compete with the present oil fuel diesel depends on its ability to operate in a reliable manner in units of large size, 1000 horsepower and up, as it is only in large units that the matter of lower cost of fuel acquires true importance. Of course, the powdered coal diesel would be helped materially by any appreciable rise in the cost of oil but this does not appear likely to occur within the next few years.

Diesel Engine In Ships.—In the diesel engine field generally, progress in the past year has been very great not so much by way of improvement of the engine itself as by the phenomenal growth of its field of application. In 1928, for the first time, diesel engine tonnage of ships under construction has exceeded that of steam driven vessels. Not only this, but the application of diesel engines on ship board is beginning to create new types of vessels which means that the diesel engine is beginning to really intrench itself in the marine field permanently. Describing the revolution wrought in ship building a generation ago by steel and triple expansion engines, Kipling in *Mary Gloster* makes the old shipmaster tell his son of the time when "we came out with nine knot freighters and captured the long distance trade." The triple expansion engine and later on steam turbine could not, however, bring the cruising speed of freighters above eleven knots and it remained to the diesel engine, with its favorable ratio between engine and propeller speed, to produce the sixteen knot freighter with its promise to monopolize the carrying of perishable goods and fast freight. The same ability to give freighters a speed only a little below that of the slower passenger vessels made it worth while to introduce a limited amount of passenger accommodation on long run cargo vessels such as, for example, those going from Europe to Pacific ports through the Panama Canal.

Hesselman Engine.—What may be considered as a new type of engine has been developed in Germany under the patents of the Swedish engineer, K. J. Hesselman. In this engine, the combustion chamber has a peculiar arrangement permitting the use of short fuel sprays. Several fuel valves are arranged in a circle around the combustion chamber, each fuel valve developing two fuel sprays. The valves themselves are of peculiar design provided with membrane discs. The advantage of the engine is said to lie not in its high mechanical or thermal efficiency but in its simplicity warranting high reliability

due to the absence of mechanically operated valves, valve rods, and camshafts.

Supercharging.—In the past year, particular attention has been paid to the problem of efficiently supercharging the diesel engine. The principle of supercharging in internal combustion engines is not new. It has been used for years on aeroplane engines, particularly those intended to operate at very great altitudes. It is becoming common practice in racing cars, and in Europe there are on the market ordinary automobiles equipped with supercharging devices. That the supercharging can be an advantage in diesel engines has also been known for a long time but in the past, no serious effort was made to put it on a commercial basis. Recently the Büchi system was introduced and promises to be a commercial success. This system utilizes the energy of the exhaust gases in a turbine directly connected with a centrifugal blower, thereby producing supercharging air at the pressure of from four pounds per square inch to as much as twenty pounds per square inch, according to the rating desired. In tests with a four stroke cycle, four-cylinder engine of 500 brake horsepower normal rating, an overload of 50% was maintained without difficulty. It was also found that the supercharging decreases the fuel consumption by about 4%.

THE WORLD'S MOTOR SHIP-BUILDING

Tonnage.—As shown by figures collected by Lloyd's for a period of three months, the motor tonnage of ships now being built exceeds the steam tonnage by a greater figure than ever before recorded,—namely, 363,081 tons. Compared with figures for a year ago, the motor tonnage throughout the world has increased by 40,000 tons and steam tonnage decreased by 230,000. These figures are particularly impressive when referred to various countries.

Engine Statistics.—A year ago, oil engines of 1,102,424 i.hp. were under construction, and this figure has increased by about 250,000 i.hp. The power of turbines, on the other hand, has fallen from 338,000 s.hp. to 214,000 s.hp. (excluding Germany), and of reciprocating steam engines from 580,000 i.hp. to 492,000 i.hp. Russia shows a remarkable increase in oil-engine construction (from about 5000 i.hp. to 39,000 i.hp.) and in Japan the figures have jumped from 8000 i.hp. to 38,000 i.hp. In Germany, also, there has been a substantial increase, from 151,000 i.hp. to 227,000 i.hp., and in Denmark from 93,000 i.hp. to 137,000 i.hp.

More and more the oil engine is being adopted on larger and faster ships. In England, at present, there are only seven steamships with a tonnage above 8000 being built, while the number of motorships is 31. For the world as a whole, there are 65 motorships above 8000 gross tons under construction and only 21 steamers.

Marine Diesel Engines.—In the United States Marine diesel engines have been installed almost exclusively as part of the shipping board conversion program under which Class A steamships, built during the war, are being modernized by the installation of diesel power. In Europe, however, as stated above, all kinds of vessels are being so equipped including war vessels; for example, the British mine layer *Albatross* is unofficially said to be equipped with diesel engines for operation at cruising speed (it carries 40,000 shaft horsepower in steam turbines for fast running). The same applies to the 65,000 shaft horsepower battleship *Königsberg* of the German Navy.

In railroad operation the diesel engine might be said to be boring in without any great advance. The diesel electric locomotive built in Switzerland for the Russian railways has apparently made good as several more of the same general type have been ordered. The Kitson-Still oil steam locomotive (see for the description of the Still engine THE AMERICAN YEAR BOOK for 1919, page 585) has made several trial runs while pulling trains of cars weighing up to 118 tons. The locomotive powered with a 450 R.P.M. six cylinder M.A.N. engine and compressed air transmission

of the Esslingen Machine Works is still reported as incompleted.

Diesel Engines in Aeroplanes.—The effort to employ the diesel engines for aeroplane drive continues both in this country and Europe. Some valuable research work in this direction has been done by the Langley Field laboratory of the National Advisory Committee for Aeronautics, while the Packard Motor Car Company has developed a diesel engine type which has been tested in September, 1928, in a Stinson-Detroiter monoplane with what is said to be a satisfactory result. The engine is rated at 200 horsepower at 1800 R.P.M. and has a nine cylinder radial air-cooled airless injection motor for the design of which Professor Hermann Dorner is said to be mainly responsible.

RESEARCH

Laboratories.—The latest available information shows that we now have in the United States upwards of 1000 industrial research laboratories with well over 10,000 trained research workers aided by a small army of assistants, mechanicians, glassblowers, helpers, etc. No accurate statistics are available giving the annual expenditure in this country for industrial research, but this runs into many millions of dollars and a number of individual laboratories have budgets of a million or more dollars a year. These are very impressive figures, and themselves definitely answer the question as to whether research is of value to present-day manufacturers.

Laboratory Functions.—As a rule, the principal function of the industrial research laboratory is to develop new and useful products and processes for the industry it serves. In some cases, its main function may be, in coöperation with customers, to develop new uses for products already developed. It may be established for the main purpose of improving manufacturing processes or aiding the development of new devices and applications based on some outstanding invention which provides the main product of the manufacturers served. Most industrial research laboratories find that an inevitable part of their work consists in curing and anticipating troubles either with the product, the processes involved, or the application of the product.

Research Expenditure.—Vast expenditures for research are not limited to the United States alone. The German industry has resumed research work on a scale even greater than before the war, and some of the results of this research are beginning to be felt in the United States. One American company is using a process of case hardening of steel developed in Germany (Nitriding), while another company, as referred to elsewhere, is making a new tool material under German patents (Carboloy). In England, large sums of money are being spent on research in several lines such as aviation, textiles, particularly linens, and coal distillation. The last mentioned work is being done by the Fuel Economy Committee and the National Federation of Iron and Steel Manufacturers: their object being to investigate the possibilities of increasing fuel efficiency in British Iron and Steel Works. A number of other committees are carrying on work for the study of coke manufacture, low temperature carbonization, etc.

HYDRAULIC MACHINERY

The Water Power Factor.—The development of water power in this country has reached a stage where a certain slowing down is inevitable. Whether this slowing down is temporary or permanent remains to be seen. In a general way, it is due to the combined action of several factors: in the first place, the most profitable water power sites have been already developed; those that remain are either more difficult and expensive to harness or else lie at a greater distance from the best markets for power; in the next place, steam power generation has reached a stage where under favorable conditions it can compete with water power on costs; finally, while other forms of power generation still work at comparatively low efficiencies, leaving a field for great improvements, hydraulic machinery has already reached very

nearly its theoretically possible efficiency. The majority of improvements in this field lie, therefore, in matters dealing with accessories.

The adjustable blade runner makes possible increased output under reduced head during flood flows when the matter of efficiency is secondary. Also, when the turbine blade angle is changed automatically, high efficiency is obtained at part load. Consequently, the principal disadvantage of the propeller-type turbine is overcome. The largest unit operating with the blade runner adjusted manually will be the Black River Plant in Canada with wheels rated at 8800 horsepower, while the first installation with blade angles changed automatically will be the Devil's River Plant in Texas with wheel rating of 1900 horsepower.

Hydroelectric Plants.—The automatic or semi-automatic hydroelectric plant is also becoming quite popular in this country. This is well illustrated by the station at Louisville, Kentucky. An unusual number of hydroelectric plants which are noteworthy either for size or special features or both have been put into successful commercial operation recently. Among these may be mentioned the Conowingo development of the Susquehanna River, the largest semi-automatic plant in operation and containing the largest propeller-type wheels in physical size that have been installed in the United States; the Norwood development on the Yadkin River, with several unique features; the Bucks Crest plant on the Feather River, with the highest head yet developed in America (2562 feet); the Big Creek 2A plant, containing impulse units of record capacity (56,000 hp.); the Lake Chelan development in the state of Washington; the Upper Tallassee development in Alabama; the Bellows Falls development on the Connecticut River; the Rocky River development in Connecticut; the first important plant in America to use in large part pumped water; the small automatic plant built on "stilts" over the Kentucky River at Dam No. 7; the Glines Canyon plant in the state of Washington: the Spaulding No. 3 plant in California, and the Alouette plant in British Columbia,—all notable automatic plants; and the extension of the Great Falls plant, Manitoba, containing propeller-type wheels notable for size and high head (56 ft.). Data regarding these installations may be found in the reports of the Hydraulic Power Committee of the National Electric Light Association on "Bibliography of Hydraulic Subjects and Manufacturers Statements" for 1927 and 1928. Special features will be mentioned hereinafter.

Pending Projects.—Important projects now under construction are the Paugan development on the Gatineau River: the Alcoa development (Chute-a-Caron) on the Saquenay River; the Back River development in Canada; Jordan Dam (Lock 18) on the Coosa River; the Saluda, Waterville, and Oxford developments in the Carolinas; the Lower Tallassee development in Alabama.

MACHINE TOOLS

Design and Material.—This is one of the few branches of mechanical engineering which apparently is facing a thorough revolution. One such revolution took place in machine tool design about the time of the Paris World Exposition through the introduction of the so-called high speed steel (Taylor and White). The cutting ability of the steel exceeded that of tool steels previously known to such an extent as to require heavier and more rigid machine tools. This tendency toward greater rigidness in tools has persisted until now.

Carboloy.—Within the past year, a new cutting material known as Widia in Germany and Carboloy in this country has been introduced. If preliminary statements made by its makers (in both cases companies of high standing) are to be believed, the new material is as much superior to the conventional high speed tool steel as the latter was to carbon cutting steel. Carboloy is essentially carbide of tungsten—a material exceeded in hardness only by the diamond—held together in a matrix of cobalt. Such is the hardness of the material that

it can easily machine not only metals like chilled cast iron and manganese steel, but also bakelite, porcelain, glass, etc. There is evidence in the introduction of new alloys that within a few years our present day metal working machines may be entirely obsolete. This situation indicates that the production policy from now on should be one of extracting from equipment of present design all of the production of which it is capable, instead of trying to make the machine tool last as long as possible.

Trends in Tool Manufacture.—In the manufacture of the machine tools themselves, a somewhat new tendency became increasingly prominent during the year and that is to make the machine not only stronger but more beautiful. As a result, lacquer finishes with variation of colors have been increasingly adopted. Among the specific advances in the past year may be mentioned the following: in the forging field there has been introduced the internal displacement method by which straight carbon and alloy steels can be forged by the process of progressively deep piercing; after upsetting, progressive dies force the stock into the finished shape. Several new tools have been developed; for example, a gear shaving machine and a milling machine with hydraulic table travel. The die-casting machine has been developed with automatic operation, the only functions of the operator being to manipulate the single clutch lever, supply new metal, clear and oil the die with an air hose and watch the casting.

REPLACEMENT OF MEN BY MACHINES

Throughout the industry and particularly in the field of machine production and materials handling there has been a tendency to replace labor by machinery. This, of course, is not a new tendency, the entire American system of production being based on the employment of machinery in order to minimize the employment of labor. It is, however, only within the last two years and particularly in 1928 that this tendency acquired such a momentum as to begin to threaten what might be called the complete employability of labor in America. It has been pointed out that the production of automobiles since 1914 has increased enormously while the number of men employed in automobile factories has scarcely changed.

In industry after industry, new machinery is introduced which either actually reduces the number of men employed or promises to produce more goods, and often goods of better quality with the same number of men. There is no tendency apparently to use this as a means to reduce wages. On the contrary, if anything, the wage trend is upward with the result that, as the number of jobs in particular industries decreases, the position of the men still employed improves. This tendency is evident not only in manufacturing, but also in agriculture where the use of tractors, harvest combines, etc., has brought about a certain reduction in employment demand.

For the present, at least, the effect of this tendency as affecting the labor market should not be exaggerated. The men thrown out of employment or deprived of chances of employment in the older industries do not necessarily become unemployed. In the first place, new industries are being created all the time. There is, for example, the radio industry which may have been considered negligible in as far as a field of employment is concerned only a few years ago, and which is producing goods now at the rate of several hundred million dollars a year. On the other hand, the machines which replace the men in the handling of materials and production, must themselves be produced and maintained, thus opening new fields of employment or enlarging fields which existed previously. Just how enormous the field of maintenance of machinery is may be illustrated by the fact that while the Ford Motor Company is not building the model T car any longer the manufacture of parts for repair and replacement is said to be equivalent to a production of twelve hundred complete cars a day.

TEXTILE INDUSTRY

The textile industry is one which not only did not participate in the wave of prosperity which swept the United States during the liquidation of war conditions but has been going apparently from bad to worse. The plants were for the most part antiquated, strikes frequent and marked by a good deal of violence with the general situation anything but attractive. In 1928, however, the textile industry began to turn the corner. It is still very far from reaching the level of prosperity of the country in general, but there is an entirely new spirit of hope pervading the industry and some actual results have been obtained. This will probably result in important consolidations and incidentally the elimination, by agreement or otherwise, of plants incapable of following the pace. The industry has realized certain things;—namely, that high machinery speeds do not necessarily mean high production or low cost per unit, that mass production in itself is not profitable today and that out-of-date men, methods and machines must be definitely eliminated. The last is probably the most important of all.

There has been a more extensive use of rayon in the textile industry last year than ever before, due to the improved yarns produced by the rayon manufacturers and better methods of handling in textile mills. In the manufacture of cotton goods, improvement has been less noticeable but the application of research methods is already beginning to do good. These cover more careful selection of cotton, better methods of picking, particularly the use of the so-called one process picking, better control of humidity, temperature and refinement in machinery. In the field of woolens and worsteds, improvement has been much less, and still less in silk manufacturing and processing. Jute seems to be slipping as an American industry. Weaving jute cloth, except bagging, is practically extinct. If low grade cotton keeps down in price and jute remains the same as now or goes higher, it will be very difficult to manufacture profitably in the United States anything but the cheapest of bagging, and certain twines for quick delivery.

WOOD INDUSTRIES

While in the past lumbering was notorious for its wastefulness, it is recognizing now the vital importance for its own continuance—aside from the good of the country—of economy and conservation. One of the most interesting developments in woodworking in the past year has been the steady increase in the use of the so-called dimension stock, which means adapting factory practice to the use of lumber stock cut at the mill to set dimensions. The practice of packaging such dimension stock is also growing. One of the big advantages of these two practices is that they permit the utilization of short length lumber and prevent a great deal of waste which is inevitable when cutting to length is done inexpertly and without standards.

One of the reasons why the lumber industry responded to the necessity of economy may be the appearance of many substitutes for wood, some obtained by utilizing wood waste and others from materials not previously used for this purpose. To the former belong such materials as masonite made from wood waste exploded to the state of fiber by the use of high pressure steam and then converted into board and similar articles. With the latter belong the materials made from such sources as sugar cane, etc.

REFRIGERATION

Important progress has been made in this field in several directions. A number of laboratories, among which the leading place is occupied by the U. S. Bureau of Standards, have continued work on the tabulation of the physical properties of fluids used in refrigeration. The so-called domestic refrigerator has continued its successful conquest of a field which formerly relied on outside-made ice. Contrary to some expectations, however, the introduction of the domestic or more correctly speaking, individual refrigerator, has not yet materially affected the general ice industry either because the demand for ice

has been increasing or, as said by some, because the use of the domestic refrigerator has created so many new applications for ice that the public ice plant recovered in new demand the ground lost otherwise.

Most of the domestic refrigerators work with compressors driven by electric power. One of them, however, invented in Sweden by Munter and Platen, has no movable parts at all and operates through the fact that one part of it is heated by gas and another part cooled by a flow of water. In railroad refrigeration, experiments were made with a silica gel iceless car. Silica gel is a hard glassy material obtained by a reaction involving the so-called water glass. It is of an extremely porous character which gives the material the ability to absorb relatively large quantities of vapor. If placed by the water in a closed vessel, it will absorb water vapor to the extent of 25% of its own weight. The water vapor may be then driven out and the silica gel becomes capable of absorbing more vapor. The rapid vaporization produced as a result of this process effects a powerful cooling of the water and, if carried sufficiently far, will produce freezing.

An interesting development in this field, in the past year, was an extensive commercial application of the so-called dry ice, which is solid carbon dioxide. While carbon dioxide was the first gas to be liquified and solid carbon dioxide was known for very many years, the methods of its production have only quite lately become such as to permit its employment in general commerce. It has certain advantages in that it melts without producing moisture, is comparatively easy to handle and generates a gas which, in the great majority of cases, is either inhibiting putrefaction or is neutral. It has been already extensively employed in the transportation of foodstuffs both in individual containers and in carloads, and other uses are being rapidly developed.

ENGINEERING MATERIALS

New materials are appearing every day in the form of alloys, utilization of by-products, etc. The few that are given here are mentioned rather by way of example and illustration than in an effort to provide a list of such materials.

The property of extreme hardness of tungsten carbide has led to the development of a new cutting metal as mentioned in the section on Machine Shop Practice. It has also been used in the material borium intended to be used in place of diamonds in rock drilling tubes. In the field of plastics, some very interesting discoveries have been made. By way of illustration, mention should be made of *glyptol*, made of glycerine and phthalic acid, which latter itself was a laboratory curiosity until a couple of years ago, and another material made of two food by-products which in the past had been wasted. One of these products is *casein* for which some use has been previously found in the manufacture of the condensation product known as *galalith*. The other is *furfural* made from straw, corn stalks, and the like. The resultant product is said to be quite waterproof and permits molded articles to form without shrinkage or distortion.

THE IRON AND STEEL INDUSTRY

Open Hearth Furnace.—Only the mechanical features of this important industry will be considered here as all the other factors of progress are covered elsewhere. There have been no radical changes in the design of open hearth furnaces generally but several important refinements have been introduced,—in particular, the sloping back wall. The so-called Stevens furnace represents to all practical purposes a combination of the best features of older designs. In England, at the Merchant Iron Works at Middlesborough-on-Tees, Benjamin Talbot installed an open hearth furnace with an auxiliary hearth. This device is used to preheat the metal, be it scrap or hot iron, before it is discharged into the main hearth. It is claimed that a material increase in the output of the open hearth furnace is thereby obtained.

Hot Metal Transportation.—A good illustration of the state of mechanical

development of the handling of materials is shown by the successful transportation by the American Rolling Mill Company of hot metal from blast furnaces at Hamilton, O., to the open hearth plant of the company at Middletown, O., a distance of some ten miles. To do this, a new type of ladle car was developed.

Rolling Processes.—Further progress has been made in the introduction of wide strip rolling and rolling of breakdowns in wide sizes. The present total capacity of the so-called continuous sheet mills is close to 2,000,000 tons per year. Of particular interest is the continuous mill installed at the Gary Plant of the American Sheet and Tin Plate Company, where a 3 inch slab is rolled down to about 0.1 inch in six passes. A remarkably close control of speed of the successive stands has been successfully realized. The Youngstown Sheet and Tube Company's 21 inch continuous sheet-bar mill at Indiana Harbor takes billets direct from the Blooming mill; the bar mill has ten horizontal and three edging stands capable of rolling material (skelp or general run of sheet-bar) from 6½ to 16¾ inches. The interesting feature of this mill is the use of roller bearings on the off side and of bronze bushings on the drive side of the feed table.

Seamless Tubes.—In the field of seamless tube manufacturing, some very real progress has been made. Introduced primarily to meet the demand of oil drilling for material stronger than welded pipe, the industry has developed to the point where it either is or shortly will be capable of competing with welded pipe not only on the basis of quality but also of prices. The first mills to make large seamless tubes in this country were of the pilger type brought over from Germany. New types, however, have since been developed in this country and appear to be more suitable for American volume of production than is the German type. Of particular interest is the plant built at Ambridge, Pennsylvania, by the Standard Seamless Tube Company, now consolidated with the Spang-Chalfont Company, as its 51-inch mill is said to be one of the largest of its kind so far built. The range of tubes to be made runs up to 15 inches diameter. Among other things, this plant, by arrangement with the A. M. Byers Company, will make seamless wrought-iron tubes from billets made by the Aston process (without hand puddling).

RAILROAD ENGINEERING

Trends in Development.—The railroads are now displaying greater activity in the way of new development, perhaps, than at any previous time in this century. Until two years ago, there was a general impression that the railway companies were averse to pioneering. Today nothing is accepted as established practice or design. There are many reasons for this situation, one of the most important being that both in this country and abroad railroad rates have not kept pace with the increase in the cost of fuel, labor, and, particularly in Europe, taxation. The railroads, therefore, have to make an effort to save what they can on the cost of operation. Another important factor is the competition on the part of motor cars and motor trucks in the field of passenger and freight transportation, and the looming specter of aircraft competition in long distance hauling of passengers and certain valuable classes of goods. In this country, it should be remembered that the railroads have been phenomenally prosperous. The first thirty-eight Class A railroads to report for October, 1928, have shown the unprecedented increase of 27.5% in net operating income as compared with October, 1927. The railroads, therefore, have money for experimental work and the purchase of new equipment.

The Locomotive.—Mechanical progress in railroad operation was primarily directed toward the improvement of the locomotive. In Europe, particularly, experiments are made with using very high pressure steam, and several such locomotives operating at pressures in excess of 750 pounds have been built. The German

General Electric Company built and with apparent success tested a powdered fuel locomotives, while the Ljungstrom Company is proceeding with its turbine locomotives. In America, also, an effort is being made to use high pressure steam but the pressures employed are still a good deal lower than those experimented with in Europe. On the other hand, the Baltimore and Ohio Railroad Company equipped one of its consolidation engines with the Caprotti poppet valve gear which has apparently given satisfaction. The Missouri Pacific has equipped two locomotives with six wheel power tender trucks acting practically as auxiliary locomotives. By this device, the tractive force of one of the locomotives was raised from 94,400 pounds to 122,000 pounds, and that of the other from 81,600 to 111,600 pounds. These locomotives were intended for use in heavy duty dump-yard switch service and the capacity of the locomotives in tons handled over the hump was found to be increased some 50%.

Car Retarder.—The mention of the hump-yard calls attention to a new device used thus far practically exclusively in the United States, and that is the car retarder. In ordinary hump yards, the car after being pushed over the hump was apt to acquire considerable speed on the downgrade run. This was handled by hand braking which was a slow, expensive and at times unsafe process. In the retarder equipped yards, the speed of the car is controlled by magnetic gears and the entire progress of the car is in the hands of the tower man.

ELECTRICAL ENGINEERING

By J. Grist Brainerd

Moore School of Engineering, University of Pennsylvania

FINANCE AND ORGANIZATION

Management Problems.—In the presidential year of 1928, technical developments in electrical engineering have been overshadowed by what might be called political, legal and commercial problems. Of the three fields into which electrical engineering is usually divided,—research, design and operation, and management,—the last mentioned has been primarily concerned with the outstanding problems of the year, although this is not by any means to be taken as indicating lack of progress in the two former fields in which development has been steady. The investigation of utilities by the Federal Trade Commission gave some material for campaign speeches of the Democratic nominee for President, while the successful candidate, Herbert Hoover, declared that the power situation was one of the three major problems confronting the country.

Rate Bases.—Outside of politics and investigations, rates and rate bases, load building, and the problems of manufacturers of electrical goods have been in the foreground. The great variation in rate bases, as determined by state utility commissions, ranging all the way from those determined by prudent investment on historic value theories to those determined by present reproduction cost less depreciation, has been emphasized and will probably be eliminated in part by court decisions in the near future.

Utilities and State Commissions.—Many state commissions—probably the majority—have refused to follow the Supreme Court's indicated leaning toward reproduction cost as a basis for rates; and some, notably the Massachusetts department, are anticipating an adverse decision (from their point of view) and are attempting to compel utilities to join their way of thinking by withdrawing state privileges of great value from those that refuse. Since regulation under the proposed Massachusetts scheme means practically regulation by contract rather than regu-

lation by law, the entire relationship of utilities and state commissions may be changed.

Load building is apparently becoming a major problem. While the use of electricity has increased at a rate of about 10 per cent a year, it is being argued that this increase has been due to the increasing number of customers, rather than increased average use. The increase in the number of customers is beginning to fall off, and if utilities are to maintain their previous rate of increase of output, they must actively join in the many campaigns now being devised for increasing the average use of power.

Power Output.—The total output of public utility plants in 1927 was 80,205,474,000 kw. hrs., an increase of less than 9 per cent over 1926. For the first eight months of 1928, total output was 53,569,000,000 kw. hrs. compared to 49,164,000,000 kw. hrs. for the corresponding period of 1927. There were 124 power systems in the United States, 15 in Canada and 2 in Mexico, and in addition 14 railway systems, which together had an output of more than 100,000,000 kw. hrs. in 1927.

Other data concerning utility plants follow (see table top next column):

	Jan. 1, 1927	Jan. 1, 1928
Operating companies	2,058	1,820
Plants	3,085	3,740
Capacity of generators (kw.)	25,398,385	27,690,891

Fuel consumption for the year 1927 was 41,888,000 tons of coal, 6,782,000 bbl. fuel oil, 62,919,000,000 cu. ft. natural gas. Average equivalent consumption of coal: 1.84 lb. per kw. hr. compared to 3.2 lb. in 1919.

MANUFACTURING PROBLEMS

Buyers' Market.—The discussion of manufacturers' problems has been centered chiefly in the fact that a "buyers' market" has existed. There has been overproduction and a huge amount of price cutting. The result has been referred to freely as "demoralizing," and some attempts have been made to rid the industry of the evils of price cutting. The jobbers also have problems on their hands: mergers have changed the buying habits of many companies, and wholesalers have been left at some disadvantage. High pressure sales methods of manufacturers have brought the manufacturers into intimate contact with retailers, in many cases doing away with the jobbers' services.

ORDERS FOR ELECTRICAL GOODS

Quarter	1926	1927	1928
First	$ 262,677,736	$243,651,415	$242,875,462
Second	248,000,075	236,427,121	224,467,209
Third	241,114,209	235,847,857	264,419,328
Fourth	260,078,082	239,999,298	.....
	$1,011,870,102	$954,925,691	.....

Exports of electrical goods in the first eight months of 1928 totaled $71,908,000 in value, an increase of 8.9 per cent over the corresponding period of 1927. These figures do not include the radio branch of the industry.

POLITICAL AND LEGISLATIVE DEVELOPMENTS

Party Attitude on Utilities.—The platform of the Republican Party in this presidential year contained little affecting the utilities, outside of an endorsement of state regulation in general. On the other hand, the Democratic platform had a water power plank which said little. Neither platform mentioned Boulder Dam, Muscle Shoals or the "power trust." Of the candidates of the two major parties, Mr. Hoover (Republican) was well received and Governor Smith (Democrat) was adversely criticized in the trade journals, which, however, had some difficulty explaining away Mr.

Hoover's support of the Boulder Dam project and his advocating government operation of the Muscle Shoals plant (see below), although declaring in general that the government should stay out of business. Mr. Smith's water power policy, virtually the same in national affairs as that which he advocated as governor of New York, was declared "unsound, unworkable and far inferior to the policy now in successful operation." Mr. Smith declared for government ownership, and in his campaign assailed the "power trust" and the propaganda of the utilities (see Federal Trade Commission investigation below). Mr. Hoover declared that the country was faced with doubt on three major problems; —prohibition, farm relief, and electrical power.

Power Policy in New York.—Locally, Mr. Smith as governor of New York advocated the creation of a State Power Authority, to bring before the legislature a comprehensive plan for development by the state of its water power. This was defeated by a hostile legislature, but the newly elected governor has pledged his support to Governor Smith's program. The situation in New York State is of more than local interest in that, among the water power considered, is that available in the St. Lawrence River. The projected international St. Lawrence waterway situation (see 1927 AMERICAN YEAR BOOK) has been quiescent, awaiting action by the Canadian government. The International Joint Commission that recommended the project has advised that an International Board of Engineers be appointed to work out details.

The Maine system is based on a law preventing the sale outside of the state of power generated within it: the Democratic candidate for governor, opposing exportation, was defeated, but the victor went no further than to favor a fact-finding commission or a referendum.

The Federal Trade Commission investigation of public utilities had its inception in a resolution offered by Senator Walsh of Montana in the United States Senate in February, 1927. Passed over at that time, it was reintroduced in the session of Congress opening in December, 1927. Originally, it called for a sweeping senatorial investigation of the finances of all public utility holding, management and engineering corporations, and propaganda and lobbying of the utilities. The Federal Trade Commission early in the year (shortly after Senator Walsh introduced his resolution) brought out the second part of a report, covering a previous investigation into the supply of electrical equipment and competitive conditions in the industry, which emphasized that "the financial operations of holding companies escape state regulation," but found little else wrong. In arguing for his resolution, Senator Walsh charged that state regulatory commissions were not actually functioning because of politics, —alleging heavy contributions to campaign funds by utilities. The resolution as finally adopted authorized an inquiry by the Federal Trade Commission into utilities doing an interstate business, holding companies and all expenditures of utilities for influencing public opinion.

UTILITIES PROPAGANDA

At once it took up its task, spending most of 1928 investigating "propaganda." Representatives of utilities' publicity bureaus in many states testified as to expenditures and sources of income, the latter being derived from the utilities. Chiefly, the work of these bureaus consisted of distributing pamphlets (sometimes in schools) and news articles, often in opposition to public ownership, in hiring speakers on occasion, and in attempting to have removed "unfair" statements in textbooks used in schools and colleges. Little that was unexpected was uncovered, but the newspapers seized with avidity the most routine details of the transactions of the publicity offices, until the resultant publicity more than counterbalanced all the previous work of the bureaus favorable to the utilities. The industry seems to have been "clumsy and careless in its publicity work and to have brought this trouble on itself." The second phase of the

investigation, which will concern finances and holding companies, and which will probably be taken up in 1929, may give the newspapers more "sensational" news. The industry has in general coöperated with the commission, but toward the end of the year the Electric Bond and Share Company, one of the largest holding companies, refused certain records to the commission, questioning the legality of the commission's demands. This may go to court.

FEDERAL PROBLEMS

Muscle Shoals and Boulder Dam Bills were further holdover legislation which faced the seventieth Congress. The American Engineering Council has declared the Boulder Dam Bill to be based on insufficient engineering data. (The dam contemplated would be the highest dam ever built.) After much debate, Congress authorized the creation of a technical board to study the feasibility of the construction of the dam. The board is to report in December, 1928. A Muscle Shoals bill was passed but vetoed. It provided for government operation of the government owned plant on the Tennessee River, built during the war, and further, it allowed profits to be used for experimental work in fertilizers.

LEGAL PROBLEMS

St. Louis Railroad Case.—The work of the Massachusetts Department of Public Utilities has been closely followed in the utility world since its attempt last year to set rates on a valuation of a Worcester utility based on the prudent investment rather than the reproduction cost less depreciation theory. The Interstate Commerce Commission, using much the same idea, commanded a small St. Louis railroad to return to it $226,000, half its excess income over that allowed on the basis of a 6 per cent return on the Commission's valuation. The Federal Court, in upholding the Commission, failed to pass on methods of valuation so that the decision which was awaited throughout the utility world was of small importance.

Massachusetts Utilities Bill.—Of great importance is the Department of Public Utilities Bill, introduced in the state legislature of Massachusetts, which is planned to forestall an adverse decision in the Federal Courts. Action on this bill was postponed for a year by the legislature. The details of the bill are best given by the following excerpt from a report of the department:

"The danger of the so-called United States Supreme Court's doctrine being enforced in this Commonwealth is so great that we think that we should at this time make preparations to avoid the results of such a doctrine. This doctrine promotes greed and gluttony on the part of the owners of public utilities. . . . We feel that the time is now ripe to enact legislation by which the companies engaged in the sale of gas and electricity in this Commonwealth shall enter into a contract with the Commonwealth so that their rates may be speedily and effectually regulated with fairness both to the company and the public, and whereby the investor will be guaranteed that in no event shall rates be so regulated that he cannot sell his securities to obtain his original investment.

"Our proposed bill provides for a readjustment of the capital of any company which applies for such readjustment upon a basis which permits the capitalization of the premiums heretofore paid in and any earnings that have been plowed into the property at the expense of the stockholder who has not received on the average a return on his investment of 7 per cent, provided also that it shall not be capitalized beyond its fair value as determined by the department or beyond the amount expended for its property used and useful in the transaction of its business. The adjustment of its capital in accordance with the bill shall effect a contract with the Commonwealth by which the company agrees that it may be regulated by the Commonwealth in such manner as the Commonwealth may determine, so long as such regulation does not prevent it from paying dividends upon its stock

adequate to maintain such stock at par.

"The bill also provides that as to those companies which do not take advantage of the bill the provisions of our statutes which require a municipality to purchase, if the company elects to sell, the latter's property located in the town before it can engage in the business of the sale of gas or electricity shall not apply. In addition the bill provides that as to such companies as do not elect to come under its provisions, they shall not be given the power to take property by eminent domain and they shall not have the power to increase their capital stock and bonds beyond what they are at present."

The Utilities Department, following its Worcester order, commanded the Cambridge utility to reduce its maximum rate from 8 to 5.5 cents per kw.-hr. The company appealed to the Federal Court and obtained a restraining order which was later vacated.

State *vs.* Federal Courts.—Several bills, arising chiefly from appeals to the Federal Court by New York City utilities, have been introduced in Congress to restrain the Federal Courts from acting until state courts pass on utility cases. The specific cause of these new bills (similar ones have appeared in Congress before) was a Federal Court decision that the refusal of the New York Public Service Commission to grant a hearing to a traction company of New York City applying for increased fares amounted to confiscation. The court granted a temporary increase pending a hearing.

Sub-Metering. — In New York, Brooklyn and Washington, attempts have been made by utilities to prevent sub-metering, *i.e.*, owners of large buildings selling the electrical energy received by them to tenants, often at excessive prices. The New York commission has pointed out its inability to touch on this question under the present law.

Investment.—Efforts to permit savings banks, etc., to invest in utility bonds have in general been futile, but in 1928 the state of New York authorized investments in certain of these.

MUNICIPAL PROBLEMS

Rates.—The trend in rates was distinctly downward, many companies announcing reductions during the year. Among larger cities affected were Chicago, Hartford, New Bedford, Cleveland, Minneapolis, St. Paul, Los Angeles, and St. Louis. Many companies took up "room rates," *i.e.*, rates based in part on the number of rooms, or on floor area. "Inducement rates," *i.e.*, those tending to cause greater use of power, have been approved and are in use.

Status of Municipal Plants.—There has been, in general, little change in the status of municipally owned plants; several cities selling plants to utilities, while other cities entered the business. San Francisco, condemning the property of two companies within the city, set a valuation of $18,894,005 on one and $9,306,537 on the other, whereas the companies claim $67,000,000 and $30,000,000, respectively. This will probably go to court. In the same city, voters approved an expenditure of $61,000,000 to purchase a water company and finish the city's Hetch Hetchy project, where electrical energy will be developed and a water supply provided.

LOAD BUILDING

Apparatus and Consumption. — Load building has come in for serious study and a great amount of discussion has appeared in the trade journals. In the domestic field, the electric range, electric refrigerator, electric water heater, and the motor driven oil heater are being pushed. The average residence consumption in the country is 400 kw.-hr. a year, yielding an annual revenue of about $30, and one active campaign has been inaugurated to double the one kw.-hr. per day of the average home. Inadequate house wiring often blocks attempts to sell new apparatus, so that preliminary campaigns for improving house wiring have been begun.

Industrial and Rural Service.—In the industrial field, there is an estimated potential load in heating

worth a billion dollars in annual revenue, and this heating load may some day be greater than the industrial motor load of today. Farm electrification is also being developed, and although the electrical industry probably looked upon rural service as a matter of good public policy rather than a profitable commercial venture originally, it is becoming evident that the agricultural load will provide an acceptable load in the future.

COMPANY MERGERS

Consolidated Gas—Brooklyn Edison.—Mergers and consolidations have become a common place in the utility field, but several large projects consummated in 1928 are worthy of comment because of the great size of the resultant corporations. The Consolidated Gas Company of New York and the Brooklyn Edison Company combined, the latter becoming part of the former by a stock exchange. The new company, the largest gas and electric company in the world, has assets of more than a billion dollars, and a combined generating capacity of 2,000,000 kw.

The United Light and Power Company obtained control of the American Light and Traction Company of New York, uniting under one control two groups with assets of $522,000,000.

The United Gas Improvement Company absorbed the Philadelphia Electric Company, raising its assets to $375,000,000. There have been printed rumors of plans for the consolidation of other large utilities with the first named company, a subsidiary of which the United Gas Improvement Contracting Company, combined with the Public Service Production Company, Dwight P. Robinson and Company and Day and Zimmerman, to form the United Engineers and Constructors, Inc., with work on hand totaling $100,000,000 in value.

RADIO

Technical developments in the radio field included quantity production of alternating current sets, and the extensive use of four electrode tubes and the dynamic loud speaker. The demand of past years for sets capable of tuning in distant stations has died out, and in its place is a growing demand for improved quality of reproduction.

Television is apparently coming into its own, and dramas, motion pictures, etc., have already been broadcast, while television receiving sets are on the market.

Transatlantic telephone service was extended and is being used at an average rate of 35 messages daily. In February, the American Institute of Electrical Engineers of England held a "joint" meeting with the aid of the transatlantic telephone. Papers read on one side of the ocean were heard and discussed on both sides.

Beacon systems and radiotelephone service from the ground have been developed for airplanes and are in widespread use.

Carrier current systems are rapidly increasing in use, and uses other than for communication purposes have arisen. The system is used for control of street lights, supervisory control of substations, etc. Superposed high frequency currents have also been suggested for circuit breaker control, advocates claiming many advantages over present systems. This may lead to important changes. Much work has been carried on in connection with the ionized regions of the atmosphere, fading of radio waves, etc., and much more will probably be done in the next few years.

The Federal Radio Commission was continued for another year by Congress, but the bill authorizing the board to continue in existence included an amendment that in each of the five zones into which the country has been divided, there shall be virtually an equal number of stations, an equal number of wave channels and equal power. The commission, in attempting to find a suitable plan, changed the wave lengths and power of almost every station, eliminating many, and making others share time on the air.

RAILWAY ELECTRIFICATION

Pennsylvania R.R.—Electrification of steam railroads is leaping ahead,

so much so that a trade journal claims that the "era of electrification is at hand." Foremost among new projects is the Pennsylvania Railroad's $100,000,000 program for the next seven years. Passenger and freight service on 325 miles of line (1,300 miles of track) from New York City to Wilmington, Del., and ultimately south to Washington, are included. Further plans, it is believed, include the Philadelphia to Pittsburgh section. Independently of the improvements outlined above, the company plans to spend about $25,000,000 in Baltimore, electrifying all of its lines within the city among other things. The new Philadelphia to Wilmington electrification (completed this year) was first used in September, making almost all local traffic out of Philadelphia over electrified lines.

Reading and B. & O.—The Reading Company's first step in a large electrification scheme, which was to have been started in April, was postponed a year because of lack of funds on the part of the city of Philadelphia for eliminating grade crossings. The work will begin in 1929. The only other railroad entering Philadelphia is the Baltimore and Ohio, which has announced plans for a small electrification including all of its lines within the city, so that in a few years steam trains should be eliminated entirely from the city.

The New York Central has been investigating the feasibility of electrifying its line to Albany, and ultimately to Buffalo. A decision to carry out this work is expected in the near future.

The Delaware, Lackawanna and Western has announced plans for electrifying 173 miles of track in the zone about New York City. It will use direct current at a potential of 3,000 volts, using mercury arc rectifiers to obtain the d.c. The Pennsylvania, on the other hand, will use alternating current at 13,000 volts, as it is already using on some of the more recently electrified portions of the system.

Cleveland will have all electric service by 1930, since all lines entering the Union Terminal are to be electrified within the city limits. The 3,000 volt d.c. system will be used.

Illinois Central.—Published results of the electrification of the Illinois Central's terminal in Chicago have been very favorable (see 1927 AMERICAN YEAR BOOK). The Illinois Central was the first large road in America to use mercury arc rectifiers. The rectifier is now becoming popular, its friends claiming that it requires less attention than a rotary converter, much less time to start, that it automatically divides the load among various units, has lower maintenance cost than a rotary converter, offers economy of space, and has good voltage regulation. Among the objections to it is that it requires auxiliary equipment, and operation depends on these auxiliaries as well as the rectifier. Experience, however, seems to show that it is as dependable as a rotary.

One important feature of the new electrifications is that power is almost uniformly being purchased. The chief reason for this is that reliability of service is greatly increased.

TRACTION

Urban Adjustment.—Urban transportation is now in as settled a state as the railroads. There is a general feeling that the period of adjustment, required by the war and the coming of the bus, is over, and that in most cities local traction companies are on their feet. New York City, with its combination of politics and mania for a five cent fare, is a glaring exception. There has been a modernization movement, old equipment being replaced, and unprofitable lines being given over to the buses. At present there are about 75,000 cars and 10,000 buses in use in the country, carrying more than 16 billion passengers annually.

Car and Bus Design.—The trend in design of cars has been toward less weight, less noise, greater clearance under motors, smaller wheels, and elimination of the old style gear case and axle bearings. Higher schedule speeds are in demand. One new drive for cars, recently developed, consists

of a light weight, high speed, completely spring-borne motor driving an axle-mounted, self-contained unit through a flexible universal joint. Some interest in trackless trolleys has been revived. This combination of bus and trolley car uses no tracks, but uses electric drive, power being obtained from overhead wires. Gas-electric buses are now in wide use; a gas-electric taxicab already has been exhibited and is now being developed.

STANDARDS

American Standards Association.—The American Engineering Standards Committee was reorganized into the American Standards Association, still restricting the scope of its work to those fields to which engineering methods can be applied. Since there is a section in this book devoted to industrial standardization, the reasons for the reorganization and the results expected will not be discussed here. However, the work of this and other standard making bodies is of huge importance to all branches of the electrical world, facing, as it does, a campaign to increase the average consumption of electricity which, if successful, will probably require the re-wiring, in part at least, of a majority of the 17,600,000 electrified homes and the sale of much apparatus.

Standards Demands.—There have been calls during the year for standardized high voltage tests, clearances between conductors, specifications, and even the standardized performance of machines. The last mentioned proposal calls for the establishment of a minimum standard for all performance characteristics of a given machine.

International electrical standardization more or less definitely showed, at the last meeting of the International Electrotechnical Commission (in Italy, 1927), that while the electrical industry in this country could agree with that in Europe on methods of rating, tests, etc., there is little hope of any agreement on such questions as voltages of transmission, practice on the two sides of the Atlantic having diverged too far to be joined again.

INTERCONNECTIONS

While a few more interconnections of big systems were reported in 1928, most interconnected systems have been working together for one to four years. The efforts of engineers in general are concentrated on getting maximum advantages from interconnections, and reducing troubles which appeared with the joining of the systems. Advantage is being taken of the lower costs of large generating units, and long distance transmission is growing more reliable, while load dispatching and relaying, control of out-of-phase current, system stability, etc., are being studied.

There has been some complaint that some companies have taken maximum economic advantage of interconnections, at once isolating their systems in cases of trouble on others, although one of the chief advantages of interconnection and indeed the sole advantage in the viewpoint of some is to be found in increased reliability of service due to expected help from interconnections in times of emergency. Another complaint is that the quality of service is sometimes lowered until "some power companies may have to discontinue interconnected operation in order to maintain the quality of service demanded by economic conditions in certain areas of major importance."

Improved communication service between systems, both by carrier telephony over transmission lines, ordinary telephone service, and even radio, have been provided to iron out faults on systems as quickly as possible: more intimate coöperation between system operators will probably eliminate other faults. Lightning, in some areas, is held responsible for 90 per cent of tie-in troubles, and still remains a serious problem despite the large research of the past few years in this field. Some engineers are beginning to question the advisability of placing more than one important transmission circuit on a single tower line. Frequency regulation on interconnected systems cover-

ing a large area has been greatly improved, and optimum distribution of load is being approached, but the effect of load transfers between neighboring companies is still partly a matter of experience rather than of rule.

One of the unique developments of the year has been the suggestion (carried out in one case) that central station companies interchange power with industrial plants. In cases where a by-product, such as blast furnace gas, in a plant can be used to generate electrical energy, and where this is the most economical use of this by-product, an "interconnection" agreement under which a central station company agrees to take all the excess power generated by the industrial concern, while the latter buys from the central station company all power required above the by-product power when it needs it, may work to the advantage of both.

FINANCES

Capital Issues.—The electrical utilities are apparently entering upon a new stage of financial policy. The refunding of high interest bonds (and some preferred stocks) has been carried on steadily, and the industry, which required $2,000,000,000 new capital in 1927, will probably do most of its financing through preferred stock issues. However, low interest bond issues of holding companies pledging as collateral all systems controlled by the particular company issuing the bonds, have appeared. Almost 80 per cent of new capital raised in the first six months of 1928 was used for refunding, compared to 47 per cent in all of 1927 and 27 per cent in 1926.

Securities Sales to Customers.—There has apparently been a falling off in customer ownership work, for while the volume of customer sales has not appreciably decreased, yet of the total financing in 1927 of utilities, only 11 per cent represented customer sales, while the average for the 1920-1926 period was 19 per cent. This is probably due to the good money market of the year. There has been criticism of this failure to continue to sell securities to customers, for the primary purpose of these sales—development of a favorable public opinion—is still present.

The American Telephone and Telegraph Company, one of the largest corporations in the country and the world's largest public utility, has announced as a definite policy that no further increase in its dividend rate will be considered.

ILLUMINATION

Localized lighting is returning to favor in the illumination field. When high intensities—30 to 100 foot candles at times—are found economically desirable, localized lighting is cheaper than general lighting, which is used in such cases to give a fairly uniform intensity through the plant of 10 foot candles or less. The tendency is toward higher intensities and careful design so that not only does a worker have more light, but he also has the best visibility. The use of prismatic reflectors backed by high powered lamps in hospital operating rooms has been shown to reduce by almost one-third the time of an operation that formerly took 20 minutes.

Floodlighting of large buildings is becoming common; varying color floodlighting being used. The use of floodlighting in any field in which 24 hour operation is economically justified is being pushed; railroad yards, construction work, docks, oil refineries, public parks, etc., have all been touched.

Beacons and Airway Lighting.—It is estimated that there were 7,500 miles of lighted airways in the United States by June 30, 1928, compared with 4,120 of a year ago. A billion candlepower revolving aeronautical beacon is to be placed on a 1,320 ft. tower in Chicago, while on a Brooklyn hotel a 480,000,000 cp. beacon was erected, the largest ever built for private use.

Automobile Lamps.—A committee of the Illuminating Engineering Society, declaring that lighting systems for automobiles which provided almost "perfect" lighting were impracticable, recommended simple head-

lights requiring no adjusting or dimming. Ten-watt multiple lamps equipped with new "intermediate" bases, smaller than the ordinary base, have been placed on the market. They are expected to find wide use in signs and outdoor decorations.

Municipal Lighting.—Los Angeles, Detroit, St. Louis, Oakland, and Kansas City all started or completed work on new "White Ways." The new Los Angeles system allows for two lights on each standard of 2,500 cp. and 600 cp. rating. The former is to be used from dusk to midnight, the latter after midnight. Time switches are used for control. The Detroit system, giving what is claimed to be the world's brightest street, also provides for less light after midnight. Twenty ampere a.c. series street lighting circuits have been introduced for supplying twenty ampere lamps, replacing the former low current circuits with transformers.

The International Illumination Congress met at Saranac, N. Y. Representatives of 12 foreign nations were present. Discussion covered most of the fields of illumination, the French ideas in home lighting; quite different from anything developed in this country and involving no ordinary fixtures, but requiring built-in low intensity light sources sometimes colored, received most attention.

Miscellaneous.—There has been a small but gradually increasing demand that transmission lines, especially near airports, be illuminated. The use of glow-tube illuminants, such as neon tubes now much used in advertising, require very high voltages; these lamps in some form, it has been suggested, could be attached directly to lines of a transmission line, illuminating the line without affecting the system. The ban on arc lights has led to much work in the motion picture field. The arc lights make too much noise where talking motion pictures are being made.

TRANSMISSION

Series Capacitors.—The outstanding development of the year in the transmission field was the insertion of series capacitors in a transmission line to balance the reactance of the line, giving approximately an a.c. line with d.c. characteristics. This installation, on the New York Power and Light Corporation 33,000 volt lines, is the first in the world. The advantages claimed are long distance transmission with less voltage drop, marked increase in stability or power-carrying capacity of long lines, automatic voltage regulation without auxiliary regulating equipment, etc.

Cables.—High voltage (132,000 volt) underground cables, introduced last year (see 1927 AMERICAN YEAR BOOK) are being studied in the more or less experimental installations extant. The cables have proved satisfactory, troubles being chiefly with oil leaks in joints and other places. It is predicted that 220,000 volt cables are soon to be had. However, cables still seem less reliable than overhead lines. One source of injury to cables may be the pulling of them into ducts. Two instances have been reported in this country of cables being laid in open trenches, as is the European custom.

STEAM PLANTS

The first American plant to be operated entirely at a steam pressure of 1,200 lbs. was announced for Wilmington, Del. It will have a 118,500 kw. initial capacity, and an ultimate capacity of 400,000 kw. There are now about 30 high pressure stations in operation in the world, and apparently the number will increase rapidly, since experimental installations have proved successful. A boiler having a capacity of 800,000 lbs. of steam per hour has been ordered for the New York Edison Company, and it is predicted that units large enough to supply individually all the steam required by turbines of 300,000 kw. rating may be expected. The 20,000 kw, mercury boiler (see 1927 AMERICAN YEAR BOOK) took its first load late in the year. Further discussion of these topics belongs to the article on "Mechanical Engineering."

WATER POWER

Hydro Records.—In April, 1928, hydro records were broken when 29,400,000,000 kw.-hrs. were obtained from water power, the proportion of the total electric energy output of utilities produced by water power being 43 per cent greater than ever before. The proportion for the year 1927 was 37.2 per cent.

Licenses and Permits.—For its fiscal year ending June 30, 1928, the Federal Power Commission reported applications for licenses totaling 925,000 hp. and for preliminary permits 1,925,000 hp. A board of Texas state engineers recommended hydro improvements for power and irrigation purposes be carried out on the Rio Grande.

Company Projects.—The Conowingo plant on the Susquehanna River, second largest hydro plant in the country, with 378,000 hp. installed, went on the lines of the Philadelphia Electric Company this year. The Southeastern Power and Light Company will soon start on a hydro project, 100,000 hp. initial installation and 260,000 hp. ultimate, 36 miles below Muscle Shoals on the Tennessee River. About 25 miles above the Conowingo station and 9 miles above the Holtwood hydro station, a new large development is soon to be begun. Just below Louisville on the Ohio River, a new hydro station of the Louisville Hydro Electric Company has a capacity of 100,000 kw. and is automatically controlled, making it the largest automatically controlled hydro station in the world. Application has again been made for a 350,000 hp. ultimate project on the Columbia River near the Canadian boundary. Several large plants are planned for Canada.

Niagara Falls.—A special international board set up by Canada and the United States to investigate Niagara Falls rejected, in an interim report, elaborate plans and recommended some simple ones for controlling and changing the flow. The board found that the scenic beauty of the Falls was in no particular danger. The Niagara Falls Power Company gained 5000 hp. of Niagara power by diversion of the water from another station.

CATASTROPHES

St. Francis Dam.—Major catastrophes of the year, as far as electrical engineering is concerned, were the failure of the St. Francis Dam and the hurricane which swept part of the south. St. Francis Dam, on the aqueduct of the city of Los Angeles, 40 miles north of the city, gave way March 12, releasing 38,000 acre feet of water, killing 300 and causing large property damage. The Bureau of Light and Power of the city had two plants of about 93,000 kw. capacity nearby, one of which was demolished. The city load was taken over by the Southern California Edison Company, long on unfriendly terms with the municipal bureau. The dam was only two years old, and apparently gave way because of faulty foundations.

Hurricane in South.—The hurricane which swept through a large section of the southern states in September, killing hundreds and causing huge property damage, naturally played havoc with lines of the utilities. In general, however, service was not cut off for more than a day. Porto Rico, however, was without light in business districts of towns for 3 days, and without power for water supply service for 2 days.

DEVELOPMENT AND RESEARCH

Generators.—There are under construction a 160,000 kv-a., 2 pole, 1500 r.p.m. and a 94,000 kv-a., 4 pole, 1800 r.p.m. single unit generator. A large synchronous condenser to use hydrogen cooling, the first commercial machine to use this, has been ordered, while many large generators have been manufactured in which hydrogen cooling has been provided for (see 1927 AMERICAN YEAR BOOK). Newer designs of synchronous motors give greater starting torques.

Insulation and Motor Control.—A new insulating material in which metallic magnesium is used has been announced. It is claimed that the new material will allow the construction of electric heaters with

higher efficiency and longer life than at present. In the motor control field, developments are centering about magnetic and time functioned control. Fluid governors are in widespread use and a 104,000 kw. unit is to have one installed in the near future.

Frequency changers have become of increasing importance with the growth of interconnection. The synchronous-synchronous type has been used almost exclusively until recently, when the variable-ration frequency changer was developed for a few cases where the former type is undesirable,—one of its disadvantages being that the power flow through it can be controlled only by manipulating prime movers on both systems. A 20,000 kw. variable ratio set has been installed.

Concrete Poles.—Material for wood poles is becoming scarce, and manufacturers have developed a concrete pole that is comparatively light in weight, and capable of sustaining heavy overloads. These poles are already popular in Europe.

Circuit Breakers.—High speed a.c. circuit breakers for use chiefly in railroad work have been developed. These breakers are designed to operate much faster than the usual oil breaker and, although available before, it is only recently that speeds approaching that of high speed d.c. breakers have been attained.

Lightning arresters, the largest yet designed, have been installed on one of the 220,000 volt lines of the Philadelphia Electric Company. It had not previously been thought that lightning arresters were justified on lines of very high voltage.

High Speed Recorder.—A new electrical instrument for automatically recording variations of electrical functions at high speeds is being used to analyse breakdowns on transmission lines, etc. The instrument is known as the Hall High Speed Recorder.

A new aluminum alloy has been produced in Germany for use in electric power lines, with good tensile strength and conductive characteristics.

Cable Problems.—Lightning and high voltage cable problems have come in for much discussion and research work. In one of the most interesting practical tests of the year, it was shown that, of 10 choke coils tested to determine how much protection they offered, effects on the "protected" side of 4 were worse than on the unprotected side.

Electric welding (see 1927 AMERICAN YEAR BOOK) has progressed and, although its use is certainly not widespread, many new structures were welded during the year and manufacturers of welding equipment will be freely supplanted soon. Only small pieces built in great quantities, and structures of such peculiar shape that they cannot be readily made from commercial shapes of steel are exempted.

SUBSTATIONS

Metal-clad switchgear has been used in an outdoor switching station, a distinct departure from conventional design. Substations are apparently falling from favor in heavy load centers, as the following excerpt from an editorial in the *Electrical World* shows: "The substation seems to be an expensive and hazardous incumbrance on the metropolitan system of the future which uses alternating current. It has served its time in the system layout and must pass because it is no longer needed as a functional device. Instead of the substation, there will be unit generators, an alternating-current grid distribution system, multiple-transformer vaults underground and synchronizing at the grid."

AUTOMOTIVE ENGINEERING

By Austin M. Wolf

Automotive Consulting Engineer, Newark

ENGINES

Style.—The year 1928 will be recalled in future years as the last stand of the four cylinder passenger car engine, with only one large manufacturer adhering to it at the close of the year. The six cylinder engine has crept into the low price class. Improved appearance of the entire vehicle, de luxe cabs and six wheelers mark the truck field. The all-metal sleeping car with accommodations for twenty-six passengers with kitchen and lavatory is the surprise from the bus world.

Power Devices.—The straight eight has gained in favor to the extent of its sole production by two manufacturers. Its flexibility and acceleration have won public favor. Increases in engine bores are numerous with the aim of greater power. This is usually accompanied by greater valve diameter or lift, or both. Added power has not only increased dimensional and other changes in the engine itself such as sturdier front drives and more rigid cam and crank shafts, but in many parts of the car through which the power is transmitted to the rear wheels.

Compression ratios are still rising, reaching a maximum of 6.2-1 for use with special fuels. For standard fuels we find engines with 5.2-1, 5.3-1 and 5.55-1 as top-notch ratios, the latter being on the border line. Comparatively short strokes, in relation to the bore, are appearing more and more in some of the newer engines.

Aluminum piston types are increasing in variety. Reversion to cast iron by a former user is to be noted, in the change from a four to a six. Stiffening the bottom of piston skirts is in evidence. Piston pins, in one case, are made a tight press-fit on the set screw side and a push-fit on the other to allow free expansion. The modern valve has been developed to a point where it is remarkably free from trouble, the problem devolving upon the seat.

Section Rods.—An opinion is crystalizing that the shape of an I-section rod assumed after heat-treating is its permanent form, and any subsequent straightening would only be momentary once the rod is placed under the stress of service. For this reason, tool equipment and methods are provided which eliminate any strain during machining operations. In heavy duty, high speed work, pounding out of the babbitt in the big end has presented a problem. Redesigning of the big end has aimed to keep the babbitt from cracking. Other than the bond provided by timing, mechanical strength is obtained by dove-tailing the babbitt into the rod at each side.

Crankshafts.—Larger crankshafts are used. Steel-backed babbitt-lined interchangeable main bearings and caps are in vogue. Crank pins smaller in diameter than the main bearings are claimed to raise the critical speed of torsional vibration and combined with the smaller connecting rod's big end causes considerable reduction of the centrifugal forces on the shaft. A vibration damper has been introduced consisting of a light metal disc accurately balanced and mounted on specially prepared rubber discs.

Lubrication.—Increased oil capacity in the sump and larger oil pumps are found in the new engines. Oil pressure relief valves of the ball type are being replaced by plungers due to quieter action. A button on the dash which cannot be pulled out when the sump is full and indicating by the extent of its protrusion the drop in oil level, is a new type oil-depth gauge operative from the seat at any time. Top cylinder lubricators are being given consideration.

Crankcase ventilation is now provided with manual control. Despite the return of one maker to rigid metallic supports, rubber engine

mountings are being developed to greater refinement. A chief aim is to provide a unit type so that engine removal will not disassemble the rubber and furthermore that it be impossible to increase its compression by taking up on the mounting bolts. One mounting consists of rubber vulcanized between several steel plates, using the rubber in tension rather than compression.

Twin ignition has been revived and in this case two breakers are actuated by the same cam, two coils feed a double arm which distributes the high tension current to terminals in a twelve-point cap. Metric plugs, being smaller than the standard, are used to avoid heating troubles and allow slightly increased jacketing around the plug boss.

Cooling.—The cross flow radiator is an innovation of the year. Finer core cells increase the radiator volumetric and heat dissipating capacity. Built-in thermostats operating vertical radiator shutters are popular. Improved fastening means for the radiator caps are to be seen. There are several cases where the water pump has been removed from the front of the cylinder block to the side of the engine. Pump packing between the impeller and the bushing mitigates against leakage. One fan is provided with an automatic clutch which disengages it at a car speed of 35 M.P.H. The fan of the self-oiling type with a gear pump incorporated within the hub is considerably used.

FUEL SYSTEM AND MANIFOLDING

Tank Improvements. — Coincident with the expiration of the basic patent on vacuum tanks, a diversity of systems has come to light besides such improvements in the tank as the booster. The electric fuel pump principle has been extended to a pumping unit located in the supply tank and also incorporated in the carburetor, replacing the float chamber. One system consists of atomization of the fuel in the supply tank, making a rich mixture and diluting it at the engine manifold. An interesting innovation is the insulating of the carburetor from the manifold to prevent any otherwise conducted heat from vaporizing any light fractions of the fuel within the carburetor.

Exhaust Protection. — Protecting the exhaust manifold from frame distortion is provided by a short section of flexible tubing in the exhaust pipe. Where sheet asbestos was formerly used, the exhaust pipe is now covered with molded asbestos. One muffler is asbestos-covered and bolted directly to the frame cross member. Another muffler installation making for more silent operation consists in securing the front end directly to the power plant while the tail pipe supports the rear end.

CLUTCH

Clutch developments are found in easy engagement, dissipation of heat and absorption of vibration. Clutch plates are given a slight wave to soften action. One clutch ring is split into twelve segments, alternate ones being offset in opposite directions and the molded composition facings are riveted to alternate segments. For truck use a double disc construction is used with thick driving plates to increase the rate of heat flow. The discs have individual hubs, the rear disc hub being piloted on the splined outside diameter of the front hub. A new resilient drive consists of a square-section rubber strip mounted in compression between a triangular hub and a rim on the driven plate, the former floating in relation to the latter and being angularly restricted by the rubber.

TRANSMISSION

Synchro-mesh.—Foremost in the year's innovations is the synchro-mesh transmission whose chief virtue lies in the ease of shifting up or down between intermediate and high. In some cases, shaft center distances have been increased, permitting the use of larger gears. Control levers are placed further forward. In several instances the gear shift lever is mounted on the clutch housing plate, giving greater room.

Universal Joint.—A pressure re-

lief valve incorporated in the center pin of the joint allows breathing action for the displacement of air caused by movement of the slip joint. When not running this valve is submerged in oil and if lubricant is forced in under pressure, the valve opens and allows oil to escape when a certain pressure and oil level is reached due to the air bell effect of the entrained air.

AXLES

Rear Axles.—Sturdier axle construction was brought about to lessen rear end noises. Furthermore the increased engine output and high vehicle speeds have required it. Thus the paradoxical situation of increasing unsprung weight through necessity, in spite of all desires in the opposite direction for better riding qualities. The problem of keeping axles quiet in the field is a vital one, particularly today when engine and other noises are at a minimum.

The special shaping of the cover plate, or the attaching of a trough thereto, assists in the lubrication of the differential gears by directing or deflecting the flow of lubricant. Chrome-plated differential pins have appeared. Axle shafts have been enlarged in diameter because of increased torque.

A hypoid bevel gear final drive has been introduced in truck work with the pinion mounted above the axle. Spiral bevel gear axles are available for trucks up to two and a half ton capacity. Cast steel housings are coming back again, replacing the welded pressed steel type. Tracks have been increased to take care of dual tire mounting. The truck field is taking a decided stand on full floating axles.

Front Axle.—Sturdier designs are seen, I-beam sections, spindle diameters and wheel bearing sizes have been increased in many instances. Knuckle pins have increased in diameter and the bushings in thickness. Larger tie rods maintain greater rigidity. For this reason, offsets are avoided.

Front wheel drives are being tested out and one maker will shortly introduce a model incorporating it.

BRAKES

Many makers have found it desirable to have a slight excess of braking action on the front wheels. One car with hydraulic brakes uses a brake cylinder ⅛ inch larger in diameter at the front than at the rear. A mechanical four wheel system uses a 55-45 front and rear ratio.

Drum concentricity is essential and is readily obtained by the use of eccentric anchor pins. A trend away from the customary anchor pin mounting is to be found in a new internal brake which while having a short shoe with a direct or customary anchor has a long shoe with self-energizing effect connected to its anchor pin by a pair of links. This provides for self-centering and immediate full contact. Sturdier drums are being used, by increasing the stock thickness. A new brake drum material has been introduced, being a graphitic steel, showing pearlite in its microstructure. One passenger car has a coiled spring mounted around the outside of the drum for silencing the brake and it has been found to aid cooling.

Stiffened brake linkage, such as cross shafts and levers, avert distortion. Cross shafts are supported in ball and socket bearings to prevent binding due to frame weave. To reduce friction to a minimum, roller bearings are used to support cam and cross shafts. Closer adjusting means are provided on the cam shafts. A brake-testing machine has movable platforms or "pieces of road" which are slid under the wheels by compressed air, brake resistance being measured either by the pressure required to move each platform or the time required to move it.

WHEELS AND TIRES

Wooden wheels have spokes of elliptic section to give more massive appearance while retaining lightness. Hubs and hub caps are larger. With a plain, large, round hub cap, a strap wrench is used for its removal. The users of small diameter wheels increase. One maker has given up the balance lugs formerly used. Dual pneumatic truck tires are replacing

the large, single rear tire formerly used. Realizing the difference in operating conditions such as medium speed and normal daily mileage as compared with intercity service and large mileage, two types of tires have been developed for passenger cars, trucks and buses to meet these varying conditions.

SUSPENSION

Foremost in suspension improvements is the double shackling of the front spring on the steering gear side in order to reduce "wheel fight." The otherwise fixed rear eye of the spring is supported in a trunnion or yoke, which is retained in a neutral position by opposing coil springs which yield under, and absorb, road shock without its being transmitted to the steering gear. To dampen out oscillations, interleaf friction is increased in holding by the spring clips a short reverse cambered leaf against the main leaf near each end of the spring. Spring periods have been reduced to give a softer ride. Independent wheel suspension has been considerably discussed and being one of the foremost means of insuring good riding qualities, it is being thoroughly investigated.

FRAME

Increase in section modulus in frame members is obtained by the further flanging of the otherwise plain channel section. Side rails are provided with downward extensions from the lower flange, while one maker has an upper flange turned up for some distance fore and aft of the front kick-up. There is a considerable vogue for widened cross members with the webs horizontal and a horizontally outward extension to each flange. An end fitting usually braces the cross member to the other side rail flange from the one to which the member is directly fastened. Front cross members have been made of box-form to give the front end torsional rigidity.

CONTROL

The variable steering gear ratio has been replaced by a constant, low ratio in a number of cases. The flat type of steering wheel of hard molded rubber over a flexible steel core is common practice. The left hand brake lever location is growing. Gear shift levers are brought closer to the wheel, being within four inches in one case.

EQUIPMENT

Lights.—Headlights are larger, usually bullet-shaped and their location is not only utilitarian but in keeping with beauty. A practical photometric testing stand developed to check beam patterns and light intensity insures compliance with the legal requirements and assures adequate light for safe driving. Cowl lights have been moved, in one instance, to the front fender, serving as parking lights.

Miscellaneous Devices. — Instrument panels are found in varied artistic finishes. Direct or indirect illumination, as desired, can be furnished by a three-way toggle switch. Gauges, in one instance, are of the revolving dial type similar to speedometers, with the panel so designed and lighted as to be easily read from the back seat. Clearance lights or, in their stead, light reflectors are required in one state law to show the extreme vehicle width when same is over 80 inches. The elimination of all junction boxes and conduits in favor of an armored and rubber covered cable system is to be noted. Also the abandonment of the circuit breaker in favor of a fuse and ballast coil.

Windshields and Bumpers.—A dash operated lock automatically operates on the transmission if the connecting cable is cut. The tandem blade windshield wiper is a welcome improvement. Open car windshield wings have been developed the full length of the front door. The plain, straight bumper is obsolete in the endeavor to kill all hard lines that might detract from the body and car ensemble. The convex bar is popular.

Shock Absorbers.—An improved rebound checking mechanism of the friction type utilizes a rubber-like material in the braking member which provides a "flowing" action over the polished steel drum. Great strides have been made with the hydraulic

type of shock absorber. They are usually double acting and with a free center. A cushion of air is sometimes used for the central, free zone. One car is provided with a built-in system in which the shock absorber is mounted on brackets, forged integrals with the front axle, the link arms being connected directly to the frame where the ball and socket joint is supplied by the chassis lubricating system.

SHEET METAL AND BODY

Fenders.—Wider and more sweeping fenders are the vogue, various raised designs being incorporated in the tips. The long fenders result in shortened running boards. Headlight tie rods have been beautified, one design being arched and chrome plated, with gracefully bifurcated fender anchorages.

Radiators.—Radiators and hoods are high. Vertical center bars appear in some radiators. The narrow rim radiator brings the hood up to nearly the front, a cut-away being provided for the filler cap. Others provide a narrow shell as viewed from the front but massive from the side. A false radiator header incorporated in the shell gives the appearance of the continuation of the shutters or of the core.

Changes in Design.—All body changes aim to improve appearance or comfort. Arched windows which are slightly curved at the top to contrast with the curve of the top rail are used. Straight lines are taboo, even in the rear window. A popular belt is one that merges forward of the windshield pillar into a bead on the hood and unites with another at the base of the windshield. The elimination of all belt moldings, combined with a belled-out panel where the belt rail would be, is one of the year's sensations. It is designed to catch the high lights in long horizontal lines in lieu of a belt. An entire body side, die-formed in a single piece, is an accomplishment of the year. Shims of molded live rubber are used for body mountings. A spring loaded bolt for the front body mounting near the dash provides some flexibility at this point.

Devices for Comfort.—Wider doors and general increase of interior dimensions insure comfort. Lighter gauge, or longer spring coils are used to improve the cushioning. Great care is used in sealing the front compartment against draughts in winter and ventilation in warm weather is provided by cowl louvres or foot operated ventilators at each side. To insulate the front compartment from noise and heat, we find the dash not only ribbed to prevent drumming but lined with fiber composition panels, felt padding, celotex or hair pads. Floor boards are wrapped in fabric or are provided with a lower side covering to mitigate against noise transmission.

Influence of Art.—The success of the convertible coupe has spurred makers on to the convertible phaeton-sedan which is a promising and growing development. The victoria bow, formerly an ornament, is now put to use providing a folding rear quarter. Colors no longer run riot but are more subdued. Color is used to emphasize the line design and to carry out the long, low, rakish appearance spelling sturdiness and speed. The influence of modern art is felt in both the interior and exterior treatment of today's cars.

NAVAL ARCHITECTURE AND MARINE ENGINEERING

By Boyd R. Alexander

Lieutenant-Commander, U. S. Navy

LEGISLATION

Jones-White Bill.—The enactment of the Merchant Marine Act, 1928 (Jones-White bill) and the strong support accorded the Naval Cruiser Bill by the President and by various

other influential individuals and organizations, have acted as powerful stimuli to the entire shipbuilding industry. The Jones-White bill provides for the loan of funds to private citizens of the United States from a "construction loan fund" for re-conditioning, improving, equipping, remodelling, or construction of vessels so as to equip them adequately for competition in the foreign trade of the United States. The sums loaned must not exceed 75% of the cost of the construction, remodelling, etc., and the vessels on which work is done must be equipped with the most modern, the most efficient, and the most economical engines, machinery and commercial appliances. To increase the revenue derived from the operation of these ships, a clause is added requiring the transportation of U. S. ocean mails and Government passengers on them exclusively when practicable.

The Naval Cruiser Bill (H. R. 11526), which comes up for consideration by Congress during December, 1928, authorizes the construction of: (a) 15—10,000-ton cruisers to be laid down in three equal groups during the fiscal years ending June 30, 1929, 1930 and 1931 respectively at an estimated cost of $17,000,000 each, and (b) one aircraft carrier to be laid down prior to June 30, 1930, to cost not more than $19,000,000. The President is empowered to suspend, in whole or in part, this program in case the United States adopts additional international agreements for the further limitation of naval armaments.

SHIP CONSTRUCTION AND DESIGN

Building Outlook.—An examination of the list of contracts now under preparation for merchant marine construction work under the provisions of the Jones-White bill, together with the spirit of optimism prevailing among the companies who habitually tender bids for naval construction, afford abundant evidence that the period of marked depression which shipbuilding has undergone during the last few years is rapidly drawing to a close. Naval architects and marine engineers alike welcome the opportunity to put into practical application the developments resulting from several years' study of new design in general; and, in the case of new combatant ships, new design as affected by the Limitation of Naval Armaments Treaty.

New Features in Naval Design.—This treaty, by limiting the displacement of individual naval vessels, effectually put an end to the previous practice of enhancing the military effectiveness of ships by increasing their size. The efforts of the designers have since been necessarily directed toward the most advantageous utilization of the weight and space available. Scarcely a single feature remains unstudied in the painstaking search for possible weight reductions. Armor has been relocated to afford protection against aerial attack; underwater protection in the form of so-called "blisters" now appears on the sides of battleships; bulkheads have been made less bulky by use of thinner plating reinforced with new types of stiffeners; watertight integrity is safeguarded by subdividing compartments to a greater extent than previously considered necessary; light-weight aluminum alloys are being utilized for ladders, gratings, and other interior fittings, as well as for engine foundations, electrical junction boxes and hundreds of other appurtenances; gas and electric welding are used instead of rivets for making an ever increasing proportion of the joints of cruisers, aircraft carriers, etc.; light-weight refrigerating machinery has completely superseded the older types; the steering gear has been modified in numerous ways; oil pressures in rams are higher, rams are smaller, hydraulic pump controls are balanced to make them easy to operate by distant control systems instead of the more bulky and complicated pilot motors; torque equalizers (details of which are not yet available) permit the use of smaller driving engines; searchlights of light-weight, ribbed construction with greatly improved lamps and shutters are used; ships' masts have been made more rigid; express type, high capacity

boilers are replacing all others; high speed rotary auxiliary machinery is now installed instead of reciprocating pumps, etc.; fuel combustion has been scientifically investigated with the result that marked increases in economy are obtained; propeller design has been systematized, and a high degree of accuracy attained, etc., etc. Certain of the more outstanding developments are commented on below.

Central Drafting Room.—In connection with the construction of the four cruisers now building in East Coast commercial yards, an unusual departure from customary procedure has been the formation of a central drafting room. The need for this arose when the Navy Department stipulated in the contracts for the construction of these cruisers that they should be duplicates in the matter of turbines, boilers, gears, shafting and auxiliary machinery. This drafting room, which is incorporated under the name of the "Marine Engineering Corporation," provides a central designing department for supplying identical designs for the four ships. In addition to the other obvious advantages of such a procedure, it has been found that the naval inspection force required to pass on all plans is much smaller than would have otherwise been required. Furthermore, plans are now acted on simultaneously, thereby eliminating much extra correspondence and delay.

HIGH PRESSURE BOILERS

A high pressure express type boiler, embodying numerous improvements over present design, has been purchased for installation at the Engineering Experiment Station, Annapolis, prior to which it will be thoroughly tested at the Naval Fuel Oil Testing Plant at Philadelphia. This boiler has a heating surface of 5,000 sq. ft. and will be operated at 600 lbs. working pressure; its weight per sq. ft. of heating surface is somewhat less than that of the present 300 lb. boiler of the same type and size. The manufacturer predicts that its efficiency will be at least 5% greater than that of the 300 lb. type. The navy has long been interested in high pressure steam installations, having previously utilized them at shore stations. It has not, however, heretofore, appeared feasible to utilize in naval vessels, steam pressures much over 300 lbs. The rapid and successful recent developments in the manufacture of high pressure auxiliary machinery, together with increased knowledge regarding methods of preventing boiler tube failures, now appear to render quite practicable the successful operation of naval boilers at pressures up to 450 lbs. and temperatures up to 700° F. Such installations will furnish to the turbines approximately 10% more energy per lb. of steam than is now obtained with 300 lb. systems,—this without requiring reheating throughout the entire steam cycle.

Considerable progress has been made in the study of the chemistry of feed water inside the boiler. Experiments are now continuing on various ships and at the Fuel Oil Testing Plant, Philadelphia, using a number of compounds, all having a sodium alginate base. Preliminary reports indicate that the result of using these compounds is to hold in solution the scale-forming elements which would otherwise be precipitated, thereby allowing the boiler to be dumped rather than necessitating a cleaning by hand. Recently a tube specimen cut from one of these boilers after 3300 hours' steaming without cleaning showed no appreciable scale. When this interval is contrasted with the normal cleaning interval of 700 hours, the great saving in labor is obvious.

TURBINES

Lexington and Saratoga.—Just prior to the final acceptance trials of these vessels, the discovery was made that the 12th stage blading of all four main turbines of each vessel was cracked near the base of the blades. The failure was caused by vibration inherent in the design. It will be noted that this blading was designed about ten years ago, since which time great progress has been made in the study of turbine blading. The results of this study were not embodied in the blading which failed, but they

have since been incorporated in the design. In order to continue with the trials, it was decided to cut out this stage (first cutting out the 13th, or last, stage) by the use of acetylene cutters. Modified trials were then held at speeds up to about 33 knots, corresponding to 145,000 shaft horsepower. Re-designed blading was later installed by the manufacturer, after which full power trials were held.

Reports from the *Saratoga's* runs above 33 knots have not yet been received, but those from the *Lexington* disclose that a S.H.P. of approximately 203,000 was developed and a speed of 34.59 knots made over the measured mile as contrasted with the required contract speed of 33.92 knots maximum at 180,000 shaft horsepower. The trial results are unusual, in that the actual shaft horse-power and R.P.M. required for the various speeds approached, with remarkable closeness, the design figures prepared in 1922. For example, at 33.92 knots, the designed R.P.M. was 317 and the designed shaft horse-power 180,000; the R.P.M. actually required was 317, and the shaft horse-power 177,000. Throughout the entire speed range of the vessel, the maximum variation of R.P.M. from the design figures was less than 5 per cent, while the variation of actual shaft horse-power was less than 2 per cent. Such uniformity of results speaks volumes for the accuracy of the design of the propellers as well as of the main propulsion apparatus. And, with regard to propellers, it may be stated that by a careful re-design of the propellers of the V-type submarines, the surface speed of these vessels has been increased by 5 per cent and the submerged speed 9% without increase of shaft horsepower.

AUXILIARY MACHINERY

An evaporating plant of the most modern naval type was recently installed in the *S.S. California.* This plant is of the low pressure type, operating entirely on exhaust steam at from 0 to 5 lbs. gauge pressure. An output of 60,000 gallons per day is obtainable from the two triple effect sets installed. The figure of 1¼ gallons per square foot of heating surface per hr. is a considerable improvement over the performance of previous low pressure sets. Similar evaporators will be installed in other vessels as needed. Inasmuch as naval vessels are required to be self-sustaining as regards fresh water, the port operation of the vessel hinges largely upon the performance of the evaporating plant. An improvement by which sufficient water can be produced with a smaller supply of steam immediately permits further economies in the use of auxiliaries. These recently have been given especial attention. For example, direct current generator sets have been reduced from about 80 lbs. per kilowatt output to 50, with a simultaneous decrease of 33 per cent in steam consumption per kilowatt. Forced draft blowers have been reduced 75 per cent in weight, the steam consumption dropping also 75 per cent for the same output.

SUBMARINE SAFETY DEVICES

The sinking of the *S-4* with the attendant loss of life of the entire crew, some of whom remained alive for about 78 hours until finally asphyxiated, thoroughly aroused public sentiment in favor of the development of additional safety devices. Of the many thousand schemes submitted from all sources, naval and otherwise, some few appear to have practical worth, such as:

(1) The replacement of voice tubes by telephone lines in order better to preserve the watertight integrity of the vessel.

(2) The installation of quick-closing watertight doors which can be fastened shut by turning one wheel instead of securing a number of individual doors as heretofore.

(3) The fitting of additional safety hatches with coamings projecting into the ship, thereby permitting the personnel to leave the submarine by the simple expedient of flooding the compartment immediately adjacent to the hatch, then opening the hatch in the usual manner.

(4) The fitting of additional salvage air connections, marker buoys, telephone lines, etc.

(5) The fitting of devices whereby a diving bell containing a rescue party, may be lowered and attached to the crippled submarine. Two of these have already been built and will be tested during January, 1929.

(6) The development of oxygen breathing apparatus. A new device called "The Lung" has been developed and successfully tried out in actual depths of water up to 155 feet, though tank experiments have extended to pressures corresponding to depths of 243 feet. This device comprises an air bag fitted with a filter and twin hose through which the wearer breathes. The air bag may be inflated with oxygen or may be blown up by mouth prior to use. The object of the appliance is to permit the wearer to re-breathe his own air while under water. The method of use is as follows: the individual members of the crew leave the sunken submarine, wearing the apparatus, ascend a certain distance by means of a line attached to the submarine, then stop for the purpose of allowing decompression to take place. After a sufficient interval has elapsed, further advance may be made toward the surface. The intervals are timed by counting breaths, allowing 16 normal breaths per minute.

DIESEL ENGINES

Constant improvement has taken place in the manufacture of parts for navy type 4-cycle, air ejection, single-acting diesel engines installed in submarines: cast steel cylinders and housings are now being successfully produced; liners are made of centrifugally cast iron of uniform texture and long wearing qualities; valve springs have been modified; valves made of heat-resistant metal with long life have supplanted the less satisfactory previous types; cylinder and piston heads have been carefully re-designed and now withstand heat far better than before; the types of cylinder rings have been vastly bettered. However, in view of the rapid strides now being made in the commercial field in the use of solid injection, the construction of double acting engines, and the successful manufacture of higher speed engines, there is promise of new engine types which will furnish increased power at a lower weight and space requirement.

VIBRATION ELIMINATORS

After considerable experimentation, there have been developed vibration eliminators for the purpose of eliminating destructive vibrations occurring at certain speeds of reciprocating engines, thereby preventing their operation at those speeds. Two different types have been manufactured: both operate to alter the elasticity of the shaft system, thereby creating another system with a different frequency and critical speeds. By changing over from one system to the other, it is possible to operate throughout the entire speed range of the installation, because in each case the unobstructed part of the system can be used.

The first accomplishes this result by coupling to the engine shaft additional stiffness. This type is too bulky for use on very large engines. It, however, operates successfully, and is now being utilized on the V-type submarines, having already been installed on the *V-5* and *V-6*.

The second type utilizes a flywheel mounted coaxially with the engine shaft and attached thereto by an elastic rod. The added elasticity of the rod produces the same result as is obtained by the first method. The shift from one system to the other is accomplished by coupling or uncoupling the flywheel from the engine shaft by means of a clutch. This type of eliminator is being installed on the *S-3* for test. If successful, it will be adaptable not only to diesel engines but also to large reciprocating steam engines such as those installed on the *S.S. New York* and *S.S. Texas*.

NAVAL FUEL

Petroleum Reserves. — The navy having practically committed itself to the exclusive use of liquid fuel for naval vessels, it becomes of great importance that a sufficient reserve be available in case for any reason the supply of liquid fuel from normal

sources should cease. During the year, the Navy Department has finally assumed full and complete jurisdiction over all oil reserves, comprising the No. 1 Reserve, Elk Hills, California, with a recoverable quantity of oil aggregating 600,000,000 barrels; the No. 2 Reserve, a leased reserve with approximately 130,000,000 barrels of recoverable oil; the No. 3 Reserve, Teapot Dome; with 20,000,000 barrels recoverable, and the No. 4 in Alaska not yet surveyed. The declared policy of the department is to shut down all wells where practicable on the reserves and to obtain from adjacent operators agreements giving the Government compensatory royalties for any increases in production resulting from the inactivity of the naval wells. This policy, if continued, will result in the conserving of the oil supply for an indefinite time, or until fuel oil for naval purposes can no longer readily be obtained elsewhere. The Federal Oil Conservation Board is making further study of the problem of regulating economically the supply of petroleum for both present and future needs and for the substitution of other fuels.

Pulverized Fuel.—Experiments have been continued at the Fuel Oil Testing Plant, Philadelphia, on various problems connected with the utilization of pulverized fuel on marine installations, particularly with reference to the problem of distribution of fuel, and also the elimination of fan troubles incident to coal passing through the primary air fan. Also, tests have now been successfully completed on a new equipment in which a separate mill is used for each burner. During the year, the *S.S. Mercer* has continued in regular operation, having to date completed six round-trip voyages from New York to Rotterdam, maintaining at all times her operating schedule. This performance is exceedingly important in that it demonstrates the feasibility of the utilization of pulverized coal when, and, if, for any reason, the available quantity of liquid fuel should become depleted.

COMMERCIAL MARINE ENGINEERING

By A. H. Jannson

Editor, *Marine Review*

ENGINEERING PROGRESS

Low Shipbuilding Tonnage.—Marine engineering progress in the United States during the past year received special impetus due to certain conditions, even though shipbuilding continued at a low ebb. In a tabulation, by *Lloyd's Register*, of shipbuilding construction figures for various countries during the quarter ending Sept. 30, 1928, Great Britain and Ireland, of course, rank first with 1,089,760 gross tons. Then follow in order Germany, Holland, France, Italy, Sweden, Russia, Japan, Denmark, and the United States in tenth place with 64,572 gross tons. Its position was even less enviable in the quarter ending June 30, 1928, when, still in tenth place, the gross tonnage under construction was only 55,502. This means that the share of the United States in merchant shipbuilding throughout the world in the fall of 1928 was only 2.56 per cent,—less than that of Denmark.

Stimulus of Inventive Urge.—Under the circumstances, there has been comparatively little pressure caused by demands on the part of American ship owners and operators for the advance of marine engineering. In spite of this, the past year has found American engineers making notable contributions to reliability, flexibility, and efficiency in ship propulsion. The outstanding reasons for such advance are closely associated with the national American inventive character, the tremendous industrial development which has called forth the highest type of practical engineering and the policy of the United States Shipping Board.

Practical Developments. — The American engineer is apt to be of a searching and inquiring mind and is not content to let things stay as they are if there is any chance to improve them. The requirements of industry and of the navy have given the large electrical companies the opportunity for practical engineering developments which are now beginning to be applied to the merchant marine. The shipping board has done an invaluable service to the country in its practical promotion of the art of diesel engine building, in the application of the diesel electric drive and also the finest kind of practical development work has been accomplished in the use of pulperized coal as fuel for marine purposes.

Jones-White Bill Stimulus.—While these engineering developments have been going on, the approval of the Merchant Marine Act of 1928, popularly known as the Jones-White bill, completely changed existing conditions by creating, almost over night, a sound demand for ships to be built in American shipyards for operation under the American flag. Certainly no law affecting the merchant marine, within the memory of this generation, has had such an immediate effect. Broadly, the two main provisions of the act which have brought this result about are ten-year mail contracts at liberal rates of payment for all boats from 10-knot freighters to fast ocean liners, and the loaning of money at low rate of interest up to 75 per cent of the cost for the building in American shipyards of new modern up-to-date vessels. A summary, prepared by *Marine Review* and published in its November issue, of the ocean mail contracts awarded under this act indicates the extraordinary stimulus in the preparation of plans and the asking for bids on new construction. Under the terms of the mail contracts awarded, over thirty vessels, many of them fairly fast passenger and cargo vessels of considerable size must be laid down and completed in a specified time so as to come within the period of the contracts.

NEW TURBINE DEVELOPMENTS

Ships in Atlantic Service.—Nowhere in the world is there a better opportunity of applying the latest developments in marine engineering. In this connection, it is interesting to review briefly some of the new work recently placed or under consideration. Moderately high steam pressure and geared steam turbines will be used for propulsion in two modern coastwise liners something over 500 feet in length projected for the New York-Cuba service. Turbine electric machinery and moderately high pressure steam will be used in an 18-knot passenger and cargo liner of over 500 feet in length recently ordered by the Grace Steamship Co. from the New York Shipbuilding Co. In a 13-knot passenger and cargo vessel under construction for the South African line by the Sun Shipbuilding & Dry Dock Co., diesel engines directly connected with twin screws will be used for propulsion. Geared turbines and reasonably high pressure steam will be used in the two new passenger and cargo vessels recently ordered by the Inter-Island Navigation Co. from the Union plant of the Bethlehem Shipbuilding Corp.

On the Great Lakes.—Perhaps one of the most remarkable instances of the old and the new side by side is on the Great Lakes where shipbuilding has been at practically a complete standstill during the year. As this is written, plans have been worked out and bids taken for the construction of two-car ferries to have a speed of 18 miles per hour and to be driven by turbine electric machinery with steam at fairly high pressure furnished by water tube boilers. On the other hand, two large bulk freighters are under consideration which in the main features of machinery will be similar to this class of vessel built twenty years ago.

In the Pacific.—Turbine electric and diesel electric drive respectively is being talked of for two of the four large and fast automobile ferries for Puget Sound. Though the power has not been definitely determined, turbine electric or geared turbine is likely to be the choice for the two

palatial 26,000-ton, 625-foot, 20-knot passenger and cargo vessels for the San Francisco-Australia service of the Matson Navigation Co.

TURBINE ELECTRIC DRIVE

Electric Liners.—A third sister ship of the turbine electric liners *California* and *Virginia*, the latter sailing on her maiden voyage December 8, will also be fitted with moderately high pressure watertube boilers and turbine electric machinery. Other definite proposals or work under way in American shipyards indicate clearly that commercial marine engineering in the United States, particularly in the development of the steam turbine and reduction gear, turbine electric drive and diesel electric drive, is easily on a parallel if not actually superior to the best work being done abroad. In fact, the deservedly respected British marine engineer has adopted in several important instances the American engineer's turbine electric drive and diesel electric drive. Reference is made to the turbine electric liner, *Viceroy of India*, built by Alexander Stephen & Son, Ltd. and the oil tanker, *Brunswick* by Scotts Shipbuilding & Engineering Co.

S.S. "California."—The first large important merchant ship installation of turbine electric drive was made in the S.S. *California*, 18-knot, 601-foot, palatial passenger and cargo liner for the Panama-Pacific line for service between New York and San Francisco. This vessel was built by the Newport News Shipbuilding & Dry Dock Co., and her turbine electric machinery was designed and built by the General Electric Co. At the time of completion, early in January, 1928, she was the largest American built liner afloat. She has been fully described in the marine publications. At this time, it is her performance in actual service which is of particular interest. Two turbine generators of 6600 kilowatts capacity each furnish electrical current to two electric motors each rated at 5250 kilowatts at 110 revolutions and each directly connected with a propeller shaft. The boilers of the watertube type built by the Babcock & Wilcox Co., burn oil and furnish steam at 275 pounds pressure and 100 degrees Fahr. superheat. She sailed on her maiden voyage Jan. 28, 1928. Recognizing the keen interest in her performance, the operating manager of the line, Capt. Roger Williams, supplied information to the Society of Naval Architects and Marine Engineers in a paper entitled "Descriptions and Trials of the *S.S. California.*"

Observations of Two Voyages.—It was found from her first voyage that the average consumption of fuel oil per shaft horsepower for all purposes was only 0.8 pounds and that she was able to make 18½ knots when fully loaded to her 32-foot draft and with the temperature of sea water at about 80 degrees. The electrification of auxiliaries gave an appreciable saving in the consumption of fresh water, an important item in reducing the quantity of makeup boiler feed. Economy was also noted in consumption of lubricating oil and it is believed that the oil originally supplied for the forced lubrication system will last for years. The performance noted on the second voyage, and which may be considered representative of what can be expected in continued service, showed somewhat of an improvement in that the fuel consumption was reduced to 0.77 pounds per shaft horsepower for all purposes. This is a particularly good performance in view of the heavy refrigerating load and large passenger demand. Great interest in the application of turbine electric drive, especially for larger vessels, has consequently been aroused and a number of proposals were being worked out toward the end of the year along this line.

Other Trial Runs.—Trials of the recently completed coast guard cutter, *Pontchartrain*, also fitted with turbine electric drive though of much less total horsepower, bears out the favorable results obtained on the *California*. Owner's trial run of the S.S. *Virginia*, sister ship of the *California*, from Newport News, Va., to New York on November 27 indicates a fuel oil consumption of 0.72 pound

per shaft horsepower for all purposes, an appreciable improvement over the performance of the first ship.

EFFICIENCY IN COAL BURNING

Pulverized Fuel.—The Fuel Conservation Committee of the United States Shipping Board, under the leadership of Capt. C. A. McAllister, chairman, and C. J. Jefferson, active head, has continued throughout the year its extremely valuable and original work in the development of practical methods for burning pulverized coal in the comparatively small combustion space of the Scotch marine boiler. The S.S. *Mercer*, which was fitted with pulverized coal burning equipment, continued in service throughout the year, and the operating results obtained from five trans-Atlantic voyages of this vessel point to several features that must be taken care of to make a satisfactory installation of pulverized fuel in Scotch marine boilers. The work done, however, demonstrates the reliability and safety of pulverized fuel in marine service; also that certain fuels not otherwise usable in Scotch marine boilers can be satisfactorily burned with the pulverized system. The economic possibilities have been indicated and the difficulties experienced are clearly defined. Progress has been made but the final standard type of installation still needs to be worked out.

Boiler Efficiencies. — Very good work on the efficient burning of coal has also been carried out during the year by the Babcock & Wilcox Co. Full sized practical tests have been run with a forced blast chain grate stoker under the same marine water-tube boiler on which tests had been conducted the year before for burning pulverized coal. The resulting boiler efficiencies compared favorably with good stationary practice. Boiler efficiencies in excess of 75 per cent were noted. The efficiencies secured averaged between 2 and 3 per cent less than the efficiencies secured on the same boiler burning pulverized coal; but due to the input power necessary for each system the overall efficiency of the stoker seemed to be at least equal to that for pulverized coal. Compared with a hand-fired installation, however, the stoker installation is at least 10 per cent better, which means a direct saving of ten per cent in the annual coal consumption.

DIESEL ENGINED VESSELS

Practical Performance. — During the year, valuable practical data on the actual performance on the converted motor vessels of the United States Shipping board were obtained. These results were summarized by Capt. Richard D. Gatewood, manager of maintenance and repair of the Emergency Fleet Corp., and presented in a paper before the Society of Naval Architects and Marine Engineers. He pointed out that the twelve vessels of this initial phase of the shipping board's diesel conversion program had traveled a total distance of 545,852 miles, and that although some mechanical difficulties had been experienced, these difficulties were such as would normally be expected in a large program of a pioneering and experimental character. Based on the actual performance of these twelve diesel ships, it has been clearly demonstrated that American manufacturers can build a satisfactory and reliable marine diesel engine in the larger sizes suitable for ocean going vessels.

INTERNAL COMBUSTION DRIVE

Trends and Results.—The past year has shown a steady improvement in material and methods of building internal combustion engines for marine purposes. The exceptionally high thermal efficiency of this type of drive has served as a stimulus in the improvement of efficiency in steam drives. There is a tendency toward considerably higher steam pressures and higher superheat. Actual results show that it is possible to obtain as low a fuel consumption as .68, possibly .65 pounds of fuel oil per horsepower per hour for all purposes in a modern American, marine steam turbine installation. Perhaps the best that can be expected in a diesel installation would be between .5 and

.55 pound of oil per horsepower per hour for all purposes. The fuel consumption for the steam installation referred to above applies, of course, only in the larger powers and the very best modern equipment throughout, including electrification of all auxiliaries. There is a definite field of usefulness for each type of power and each project should be studied by itself, taking into consideration all the circumstances attending the service. If studied on this basis, the diesel engine is bound to show its superiority in some instances and turbine or turbine electric drive in other instances.

Diesel Electric Installation.—Another interesting development carried out by the Shipping Board is the modification of the hull lines and the installation of diesel electric machinery in three large freighters. These vessels are known as the *Courageous*, *Triumph* and *Defiance*, and they were originally equipped with geared turbines, single screw drive. The first of these, the *Courageous*, undergoes her trials as this is being written. Both fuel economy and an increased speed to over 14 knots is anticipated.

AUXILIARY EQUIPMENT

The Electrical Influence.—From a review of the past year's progress in commercial marine engineering, it is apparent that the greatest progress has been made in the application and in the development of main propulsive units rather than in auxiliary features. There is a good reason for this as much has already been accomplished along that line. The genius of American engineering is clearly shown in the strides that have been made in the recent past in the application of electricity to shipboard for practically every imaginable service. On modern American ships, the motive power at the point of application is now becoming more and more universally electric. Electricity has also been applied and, in fact, has made possible the American inventions of the gyroscope, gyro stabilizer, automatic steerer, an instrument known as the fathometer for automatically determining the depth of water, and countless other devices from windlasses for weighing anchor to machines for culinary purposes, such as peeling potatoes.

MATERIALS OF ENGINEERING AND CONSTRUCTION

By C. Laurence Warwick

Secretary-Treasurer, American Society for Testing Materials

BEHAVIOR OF METAL

Corrosion.—Studies of resistance of metals to corrosion continue to be of major importance. The Committees on Corrosion of Ferrous and Non-Ferrous Metals (Am. Soc. Testing Mats., *Proceedings*, vol. 28, I, 1928) report progress in outdoor exposure tests of iron and steel products, including various types of metallic-coated articles. A study of corrosion of metal culverts to determine the type of base metal best suited for the various service conditions has been initiated; while in the field of non-ferrous metals and alloys, comprehensive research including total and alternate immersion tests, spray tests, accelerated electrolytic tests, atmospheric corrosion, corrosion in liquids and galvanic and electrolytic corrosion is now under way with widespread support from industry.

The development of alloys of the iron-chromium-nickel system, having superior resistance to corrosion and to oxidation at high temperatures, has progressed so rapidly in the past few years as to lead to the formation of a new committee of the American Society for Testing Materials that will study the properties of these alloys, disseminate information about them, and develop such standards for tests and specifications as may be consistent with their commercial uses. Here is a field of great importance to such industries as the electrical, chemical, automotive, naval construction, power plant operation and oil

refining. The welding of these alloys present difficulties not usually encountered in the welding of ordinary low-carbon steel. A method of gas welding of high-chromium alloys is described by W. B. Miller (Am. Soc. Testing Mats., *Proceedings*, vol. 28, II, 1928) who discusses the welding properties of six groups of chromium alloys. The results showed that so-called "stainless steel" is unsuitable for welded parts subjected to corrosion coupled with severe stress or vibration, due to the hardness and brittleness of the welds and the difficulty of heat treating and surface finishing. In the as-welded condition, welds in stainless iron were also found to be quite brittle and should be heat-treated to restore toughness and ductility to the metal affected by the heat. The value of annealing sheets after welding is demonstrated.

Fatigue of Metals.—The effect of corrosion upon the fatigue strength of various metals (see THE AMERICAN YEAR BOOK, 1926, p. 828; 1927, p. 578) was an important contribution by D. J. McAdam, Jr., to corrosion and corrosion-fatigue phenomena. He has continued his investigations and describes (Am. Inst. Mining and Metallurgical Engineers, *Transactions*, 1928; also Am. Soc. Testing Mats., *Proceedings*, vol. 28, II, 1928) the corrosion-fatigue of ferrous and non-ferrous metals as affected by time, cyclic stress and number of cycles. The effects of corrosion induced by salt water, carbonate water and artesian-well water upon the fatigue properties of ingot iron, plain carbon steel, steels alloyed with chromium, nickel, molybdenum and vanadium, stainless iron, monel metal, aluminum and duralumin are here reported by this investigator, who is opening up for study new fields of far-reaching importance wherever materials are used under corrosive conditions and repeated stress. In the present papers McAdam has developed the phenomena of corrosion occurring simultaneously with fatigue stresses, showing how the depth and sharpness of corrosion "pitting" increase with increase in stress and discussing certain important relationships between range of cyclic stress and corrosion. He has presented several interesting hypotheses to explain the observed phenomena, concerning which there is need for study along these lines by other investigators to corroborate McAdam's findings. These papers will well repay the study of those interested.

A comparison of corrosion and corrosion-fatigue with respect to the factors involved, many of which are common to both cases, is described by F. N. Speller, I. B. McCorkle and P. F. Mumma (Am. Soc. Testing Mats., *Proceedings*, vol. 28, II, 1928). Experiments are described showing the effect of inhibitors on corrosion-fatigue with and without other external influences tending to accelerate corrosion. It is shown that a small amount of sodium dichromate will prevent the lowering of the air-fatigue limit by corrosion, but where a strong tendency to pitting is introduced, in addition to cyclic stress, a much larger amount of inhibitor fails to prevent a serious reduction in the endurance limit. However, the use of inhibitors under such conditions tends to increase the useful life of the metal under fatigue by slowing up the action of localized corrosion. The results indicate the need of developing protective coatings that will not break down in service under cyclic stress.

Fatigue properties of some cast irons, including several of unusually high strength, are reported by J. B. Kommers (Am. Soc. Testing Mats., *Proceedings*, vol. 28, II, 1928). The fatigue endurance limit of cast irons may be roughly estimated from properties such as tensile strength, hardness, and modulus of rupture, but knowledge of the effect of available factors in influencing the properties of cast iron is so meager that such approximate estimates of endurance limit should always be checked by direct experiment. The endurance limits were approximately ⅛ the compressive strength and from ⅖ to ½ the tensile strength, with some values as high as 24,000 lbs. per sq. in. No consistent relation was found between endurance limit and chemical composition. The paper suggests the

need of further study along several lines, such as influence of melting and pouring temperatures, heat treatment of castings and effect of alloy additions.

Metals at High Temperatures.—The properties of metals at high temperatures have been discussed in previous reviews (see THE AMERICAN YEAR BOOK, 1925, p. 843; 1926, p. 827). Recent studies have stressed the importance of the phenomenon of "flow" of metals at various temperatures under long-continued applications of moderate stress, many engineers having shown concern for the safety of their equipment since this flow seems to take place at lower loads than anticipated and at temperatures well within the working range of oil refineries and steam stations. J. J. Kanter and L. W. Spring (Am. Soc. Testing Mats., *Proceedings*, vol. 28, II, 1928) describe "flow" tests on carbon steels at various temperatures with particular reference to stresses below the proportional limit. Steels that have undergone small amounts of flow do not seem to have deteriorated, their tensile properties remaining approximately what they were before the flow tests. Since little or no deterioration occurs or should be expected (unless through oxidation), and since with ductile metals at temperatures above 600° F., 10 per cent or more of flow or elongation is necessary before the material starts out on its final stretching preceding rupture, the authors argue that any slight flow or deformation brought about by stresses below the proportional limit should be considered as distortion only and not seriously objectionable unless such distortion interferes with service.

A Joint Research Committee on Effect of Temperature on the Properties of Metals is engaged in standardizing methods for determining properties of metals at high temperatures and in outlining and fostering new research in this field. There is much need for the correlated study that this committee is giving to this problem. In its first report to the societies sponsoring its work, the American Society of Mechanical Engineers and the American Society for Testing Materials, the committee has reported on comparative high-temperature tension tests on carbon steel and a chromium-molybdenum steel carried on in a number of laboratories (Am. Soc. Testing Mats., *Proceedings*, vol. 27, I, 1927). Similar tests on a stainless steel and nickel-chromium alloy and on pure nickel are practically completed, and the whole series is being studied for its bearing upon standard test methods and apparatus. The tests will also supply valuable data concerning the tensile properties of these materials at temperatures between 70° and 1200° F. Data on the relation between short-time tests and long-time flow tests are being obtained and studied. The Committee has submitted data on the thermal expansion over a range of 0° to 500° C. of the five materials being tested. The Committee has initiated a series of tests to determine the fatigue properties of a group of carbon and alloy steels at elevated temperatures.

A bibliography on the Effect of Temperature on the Properties of Metals has been compiled by the joint committee and published in pamphlet form by the American Society of Mechanical Engineers. The bibliography is indexed chronologically (1825-1928) and by authors and contains a subject index.

The "seizing" or binding of metals operating in contact with each other without lubrication, and under various conditions of temperature and pressure, is discussed by N. L. Mochel (Am. Soc. Testing Mats., *Proceedings*, vol. 28, II, 1928), who has devised an apparatus to study this phenomenon.

STRUCTURAL STEEL

Tensile Strength.—The widespread use of structural steel lends importance to studies of the elastic strength of structural steel shapes (I-beams, channels and angles) reported by M. O. Withey (Am. Soc. Testing Mats., *Proceedings*, vol. 28, II, 1928) who has determined tensile and compressive properties of specimens cut from various parts of such shapes. The tensile strength was uniform for specimens taken from a given shape, but

ranged for different shapes about 22 per cent. The average yield point for the different shapes exhibited a spread of 33 per cent both in tension and in compression, with an average ratio of yield point to tensile strength of between 0.59 and 0.64, with an individual minimum of 0.50. The weighted yield point in tension from a given shape was a good measure of the ultimate strength of that shape in compression, thus confirming other experimenters in this significant factor in design of structural compression members.

Yield Point.—A work of unusual significance is that of the Research Committee on Yield Point of Structural Steel in determining (1) the range in yield point of structural steel as furnished under present-day specifications, (2) the significance of the yield point when determined accurately and (3) a procedure for determining yield point with sufficient accuracy at minimum expense. The Committee's current report (Am. Soc. Testing Mats., *Proceedings*, vol. 28, I, 1928) discusses this latter phase based upon many hundreds of tests of specimens from steel rods of very uniform quality and from structural steel shapes. Tests to determine range of yield point and proper location of test coupons to give reliable information about yield point, tensile strength and ductility, are now being made.

Sulphur Effect.—Tests to determine the effect of sulphur on structural steel plate (Am. Soc. Testing Mats., *Proceedings*, vol. 27, I, 1927) indicate that sulphur up to 0.077 per cent, which was the highest sulphur content examined, is not detrimental. Within that limit there is no systematic relation between sulphur and the various physical properties of plate tested in the natural, normalized, annealed and quenched conditions. These conclusions may in time influence requirements for sulphur now written into specifications for structural steel.

The Metallurgy of Steel Making.—There is promise of a long-felt want being met through the fundamental research in steel manufacture that is being carried on by the U. S. Bureau of Mines and the Carnegie Institute of Technology under a Metallurgical Advisory Board upon which a number of the large manufacurers and users of steel are represented. While much study has been given to the production of pig iron and steel and to the influence of various processes of manufacture upon the properties of finished steel, there are many problems in steel metallurgy which need concerted, intensive study on a wide scale. (Carnegie Inst. Technology, *Bulletin* No. 27.) Perhaps one of the most important phases of the whole subject from the point of view of the user of steel is that which deals with the reactions of slag and metal in the open-hearth furnace, with particular reference to the formation and elimination of non-metallic inclusions formed from manganese, silicon and aluminum. C. H. Herty, Jr., and G. R. Fitterer have described the first experimental work under the above program in two papers (Am. Soc. Steel Treating, *Transactions*, 1928; Am. Soc. Testing Mats., *Proceedings*, vol. 28, II, 1928) on the function of silicon in the basic open-hearth process and the deoxidation of steel with silicon. The type of inclusions formed in steel where various amounts of silicon are added to the bath and the effect of silicates on the forging and rolling of the steel are described by these authors. Commentators on this work have expressed the belief that studies of this kind will point the way to the ultimate production of a "cleaner" and more dependable steel that will respond more definitely to various heat treatments and that can be used with greater safety and economy.

ALLOYS

Trend in Non-ferrous Development.—Some important new alloys have been developed in recent years. One is the alloy copper 96 per cent, silicon 3 per cent, and managanese 1 per cent, known under the trade name "Everdur." The metal is highly resistant to corrosion and has a tensile strength and elastic limit equal to those of medium-carbon steels, which it may replace where engineer-

ing requirements demand the strength of steel together with freedom from rust and high resistance to corroding gases, vapors and liquids. It is capable of being rolled or drawn in the form of plates, sheets, rods, wire, etc., and can be cast or forged, machined and welded.

Adnic.—A new white metal alloy of the composition copper 70 per cent, nickel 29 per cent, and tin 1 per cent has been developed (Am. Inst. Mining and Metallurgical Engineers, *Transactions*, 1928) and is patented under the trade name "Adnic," an abbreviation from admiralty nickel. This alloy has excellent properties, with a tensile strength ranging from approximately 60,000 lbs. per sq. in. for hot rolled material to well over 100,000 lbs. per sq. in. when hardened. It is stated to be free from the well-known phenomenon of season cracking and to have excellent resistance to various corrosive media as well as good properties at high temperatures. It is ductile and can be produced in both cast and wrought form. At present its principal commercial use is in the production of sheets.

Nickel Alloy Test.—Some interesting mechanical data on nickel and some of its commercial, corrosion-resistant alloys were determined by W. A. Mudge and L. W. Luff (Am. Soc. Testing Mats., *Proceedings*, vol. 28, II, 1928), including mechanical properties in tension, torsion, impact and hardness. Three grades of pure nickel, two of manganese-nickel and one copper-nickel (constantan type) tested were found to have exceptionally high ratios of strength to ductility and in this respect surpass most steels and other non-ferrous products. It was found that additions of manganese up to 4.63 per cent result in a definite increase in strength, toughness and hardness with practically no decrease in ductility.

Gold-Silver Alloys.—Some developments in the use of gold-silver alloys as a substitute for platinum in electrical circuit contacts are described by E. F. Kingsbury (Am. Inst. Mining and Metallurgical Engineers, *Transactions*, 1927), who discusses the rather complicated behavior of the noble metals in the operation and closure of electrical circuits.

Beryllium has certain properties such as low density, high hardness, good corrosion resistance, low thermal expansion and fairly good electrical conductivity, which would indicate that it is worthy of consideration as an ingredient of light alloys. It was not until recently, however, that beryllium could be produced with sufficient ease to encourage research along this line. The production of beryllium by electrolysis from a fluoride bath has now developed to the stage where it could be used commercially if there were sufficient demand for it. R. S. Archer and W. L. Fink (Am. Inst. Mining and Metallurgical Engineers, *Transactions*, 1928) have presented an interesting study of the influence of beryllium when alloyed in varying proportions with aluminum and certain aluminum alloys. The constitution and structure of the beryllium alloys have been rather fully investigated. Aluminum-beryllium alloy sheets seem to have very satisfactory properties; and beryllium between 0.05 and 0.25 per cent increases the hardness of aluminum-copper alloys containing 3 and 4 per cent of copper both with and without heat treatment. Beryllium seems to have significant influence upon the age-hardening properties of certain aluminum alloys. Beryllium apparently does not noticeably improve the resistance to corrosion of any of the alloys tested and seems slightly to decrease this resistance when the alloy is in the annealed or as-rolled condition. The authors believe that alloys of lower beryllium content offer the greater commercial possibilities except possibly for very special purposes.

Die-casting Alloys.—Although die castings are now widely used in many industries, there is a surprising lack of dependable information on the properties of the alloys commonly used for such castings. This has led the American Society for Testing Materials (*Proceedings*, vol. 28, I, 1928) to undertake an investigation of

aluminum-base and zinc-base alloys that will involve the testing of upwards of 75,000 specimens. Tensile strength and hardness are important properties to be determined, the latter involving some significant modifications in the Rockwell hardness machine. A suitable impact test has been developed to determine the relative brittleness of the alloys, and their relative resistance to corrosion will be determined by means of outdoor exposure tests. Such a comprehensive research may confidently be expected to result in improved quality of die castings.

A New Tool Material.—The development of an alloy of tungsten carbide and cobalt is described by S. L. Hoyt (Am. Soc. Steel Treating, *Transactions*, 1928) as the first marked improvement in cutting tools since the introduction of high-speed steel. This new alloy, developed by German scientists, is capable of being formed into tools of approximately half the strength of high-speed steel but with a Brinell hardness of over 2000 (capable of scratching sapphire). Machining tests on extremely hard steels, glass, porcelain and other abrasive compounds are described by this author; and the new material is shown to be greatly superior to high-speed steel in ordinary machining operations and capable of sustaining cutting at speeds which are several times those commonly used. Experience gained in the production and use of tools of this new material indicate its indispensability in many lines of work despite its greater cost; and if the present limited experience is not misleading further possibilities of development are both manifold and attractive.

Welding and Heat Treatment.—Mention should be made of the increased use of welding in many manufacturing processes, carrying with it important problems involving quality of materials. Welding of structural steel buildings in many ways has already passed the experimental stage. Refinements in methods and control of heat treatment processes are contributing to improved quality of metals and are proving especially valuable in commercial production of castings.

NON-METALS

Cement.—For the past several years the Committee on Cement (Am. Soc. Testing Mats., *Proceedings*, vol. 28, I, 1928) has been critically studying the methods of testing cement. Chemical composition, fineness, time of setting, and strength were determined for 32 cements by 47 laboratories throughout the country, but the data indicate that the various laboratories do not obtain the concordance in their testing that good commercial practice demands. The problem of devising a specification test for portland cement which will give a truer indication of its concrete-making qualities than do present specifications is ever assuming more importance. The compression test of fluid "neat" cement mixtures (see THE AMERICAN YEAR BOOK, 1927, p. 580) has not proved satisfactory for this purpose; but a compression test of plastic cement mortar gauged to the same water-cement ratio as the concrete in which the cement is to be used (E. M. Brickett, Am. Soc. Testing Mats., *Proceedings*, vol. 28, II, 1928) has shown very encouraging results in this direction and is being studied at present by the above-mentioned Committee on Cement.

The constitution of portland cement and the strength of portland cement in mortars and concretes continue to engage the attention of a number of investigators (Am. Concrete Inst., *Proceedings*, vol. XXIV, 1928). The Portland Cement Association and the National Bureau of Standards are still engaged in an exhaustive chemical and physico-chemical study of portland cement and the pure compounds of which it is formed. Notable progress has been made in phase equilibria studies.

Concrete.—Durability of concrete, in distinction to strength, has been given far more attention by investigators in recent years. Three distinct types of studies are reported (Am. Soc. Testing Mats., *Proceedings*, vol. 28, II, 1928). A. H. White has shown by tests extending over a period of 25

years that expansion in water and contraction in air seem to be universal characteristics of portland cement of even the most diverse chemical compositions. The extent of the volume changes is influenced by the conditions surrounding the material during the early weeks of the hardening process. Neat cement bars which lie in water continuously show slow expansion for two years; good cements should show no further expansion if they are kept in water for a longer time. Bars of neat cement which are allowed to dry in air immediately after removal from the molds all shrink, unless they contain free lime. Cements relatively low in alumina and high in iron oxide show the lowest volume changes with variations in moisture. Free lime causes unusual expansion during the first few weeks in water, but its hydration should be finished in a year. The significance of these data upon durability of concrete is evident. D. G. Miller discusses another phase of durability, that is, resistance of portland cement concrete to the action of sulphate and other alkaline waters, such as are found in many localities in the western part of the United States.

Tests on some 30 cements show that cements may vary greatly in resistance to sulphate waters; under the same exposure conditions the more resistant cements have outlived those of less resistance by as much as eight times. Portland cements that have failed quickly in the laboratory in solutions of sodium sulphate have ordinarily displayed low resistance in the field to the action of mixed salts. Unfortunately, the standard physical tests and chemical analyses of cements give no indication of their resistance to sulphate waters; possibly geological differences of raw materials may be a factor. An accelerated test by submerging standard cement briquets for 6 months in 1 percent solutions of sodium and magnesium sulphates is recommended as the best yet available for determining the durability of concrete in the presence of sulphate waters. C. H. Scholer has measured durability of concrete by its resistance to alternate freezing and thawing, correlating his studies with field investigations. Variations in water-cement ratio of plastic workable concrete seem to have a marked effect upon durability, wetter mixes being less durable. The physical characteristics of the mortar after failure are such as to give the impression of chemical or solution action.

Methods for control of "crazing" —the name given to occurrence of fine cracks in the surface of mortars and concretes—still elude the grasp of concrete technologists. The chief cause is well understood, that is, unequal expansion and contraction of the surface and the main body of the material due to drying out of the surface. Test panels of mortars are under observation at the National Bureau of Standards (Am. Concrete Inst., *Proceedings*, vol. XXIV, 1928).

Workability of Concrete.—The "workability" of concrete in mixing and placing is now recognized as a factor in both durability and strength of the finished product and much attention is being paid to it, both in the field and in laboratory experimentation. However, since workability is the resultant of several properties of the ingredients and not a simple physical property, it is difficult of precise definition and measurement. It is affected by the quality and fineness of the cement, proportions of the mix, the character and grading of the aggregates, quantity of water in the mix, type of mixer and time of mixing. Numerous devices have been developed for measuring the flowing and working qualities of concrete and are described by G. A. Smith and G. Conahey (Am. Concrete Inst., *Proceedings*, vol. XXIV, 1928). These investigators have developed an improved penetration apparatus which measures the energy required to drive a system of rods into a mass of fresh concrete. Another interesting method that has practical possibilities measures the power consumed in mixing the concrete (W. F. Purrington and H. C. Loring, Am. Soc. Testing Mats., *Proceedings*, vol. 28, II, 1928).

Building Brick.—Much authorita-

tive information has been obtained as a result of recent researches in the field of brick and brick masonry. A comprehensive study of the compressive strength of brick masonry has been under way at the National Bureau of Standards for the past several years. It is recognized that the strength of the individual brick unit is one of the most important factors in determining the compressive strength of brick masonry but opinions differ as to which one of the strength properties of the bricks is the controlling factor. J. W. McBurney (Am. Soc. Testing Mats., *Proceedings*, vol. 28, II, 1928) reports tests on 186 brick walls where five different makes of brick were used. The bricks were tested in compression flatwise and edgewise, in transverse bending, in tension and in shear, and ratios of these strengths to both maximum compressive strength of wall and strength at first crack were calculated. Comparison of the ratios where workmanship, strength of mortar and type of construction were the same indicate that the compressive strength of brick-tested flatwise gives the most uniform relation to strength of masonry. McBurney also points out (*The American Architect*) that a comparison of the compressive strength of brick with the percentage increase in strength secured by the use of what may now be referred to as superior workmanship, leads to the conclusion that with the use of stronger brick, the advantages gained by superior workmanship diminish. Workmanship characterized by filled vertical joints and ungrooved horizontal joints will give an increase of strength over the results of workmanship characterized by unfilled vertical joints and grooved horizontal joints of from 24 to 112 per cent. Other things being equal, the thinner the mortar joint the stronger the masonry.

Fire tests of brick walls made of clay, shale, sand-lime and concrete brick have recently been completed at the National Bureau of Standards (*Technical News Bulletins* Nos. 124 and 132). The walls were tested either restrained within rigid frames or unrestrained with freedom for expansion and deflection, both conditions occurring in ordinary building construction. Some walls were placed under a working load of 160 lbs. per sq. in. during the fire test. Important conclusions are drawn respecting fire resistance classification of such walls. As to the bricks themselves, serious damage was confined generally to those next to the fire. Hard bricks were more susceptible to cracking than softer bricks but showed greater strength after the fire test.

Staining and efflorescence of limestone caused by moisture seepage through masonry backing materials is described by Lee Huber (Am. Soc. Testing Mats., *Proceedings*, vol. 28, II, 1928), who concludes that the best method for the prevention of efflorescence and staining is to eliminate seepage by proper construction practices. His experiments with different brands of commercial waterproofing materials showed that they were not reliable preventatives. Parging the back of stone with a mortar made from waterproof cement is recommended as effective.

PETROLEUM PRODUCTS

Tests.—The growth of the petroleum industry has been accompanied by the development of a variety of physical and chemical methods for the testing of petroleum products. Physical tests are more widely used than chemical tests, the latter serving principally to protect against impurities or undesirable constituents. A suitable choice of tests and the assignment of proper numerical values to specifications based upon these tests is important. The American Society for Testing Materials has standardized the more important tests, and to meet the need for authoritative information on the significance of test results it has issued (*Proceedings*, vol. 28, I, 1928) a comprehensive report discussing the property or characteristic of the petroleum product to be evaluated by each test, the scope or applicability of the various tests, and the significance and interpretation of results.

Gasoline and motor oil are two of the most widely used petroleum products, and a discussion of their significant properties is of much importance to the vast army of users of these materials. J. B. Hill (Am. Soc. Testing Mats., *Proceedings*, vol. 28, II, 1928) points out that opinion as to what constitutes a good motor gasoline has changed very materially in the last few years. The properties required by the modern automobile engine are primarily ease of starting in a cold motor, normal functioning without choke at the lowest possible temperature, uniform feed from the carburetor, and combustion under high cylinder pressures with minimum detonation. These points can be suitably covered by volatility and detonation tests. Other characteristics such as odor, corrosive qualities of the fuel itself or of the exhaust gases, crank-case dilution and formation of solid deposits are important secondary requirements. Handling, transportation and storage require in addition that the fuel have a minimum evaporation loss, that it be not subject to chemical or physical change on long standing, and that it be as free as possible from any harmful physiological effects from contact with it. Practically all of these requirements can be covered by the laboratory tests that are now used to determine gasoline quality. It is interesting to note that color and gravity, the criteria of former times, are conspicuously absent from these significant tests.

As to motor oils, R. E. Wilson and D. P. Barnard (Am. Soc. Testing Mats., *Proceedings*, vol. 28, II, 1928) have grouped the tests under four general heads: (1) Tests for properties that are important in service, including viscosity and temperature coefficient of viscosity, pour test, and carbon residue; (2) tests that have little relation to performance but which may indicate contamination or inadequate refining, including color, water and sediment, neutralization number, and corrosion test; (3) tests that have little or no bearing on performance but which may indicate the probable source of the oil, including gravity, and flash and fire tests; and (4) tests designed for other products but which are sometimes injudiciously applied to motor oils, including those for sulfur content, unsaturation, emulsification, evaporation, precipitation, and analytical data. Two properties of possible importance, oiliness and resistance to oxidation, are mentioned, for which satisfactory tests are not yet available. It is significant that these writers place only three tests in the first group, but they believe that this substantially represents the facts in the light of present knowledge, and that a better recognition of this will eliminate unnecessary specifications and make it more certain that purchasers will get what they really need.

TESTING

Wear Testing.—It was pointed out last year (see THE AMERICAN YEAR BOOK, 1927, p. 583) that the wear testing of metals is a very important but complicated subject and, as recommended by H. J. French, each application of metals involving wear should be considered by itself until more fundamental information has become available. The same author has reported this year upon the wearing and mechanical properties of two groups of copper-tin-lead alloys (bearing metal) in both chill-cast and sand-cast conditions (Am. Soc. Testing Mats., *Proceedings*, vol. 28, II, 1928). The first group consisted of bronzes with a copper-tin ratio of about 92.5 to 7.5 and lead varying from 0.25 to 25 per cent; in the second group the bronzes contained a copper-lead ratio of about 84 to 16 and tin varying from a trace to 10 per cent. Some important relations have been recorded and merit careful study. In general, the wear test results, when combined with suitable mechanical tests, gave comparisons which were consistent with experiences in practical service. There is a considerable range of chemical composition within which the variations in mechanical and wearing properties are small. This includes a range from 15 to 25 per cent of lead and from around 4 to 7 per cent of

tin. Since alloys within the entire range have given reasonably good performance in locomotive and journal bearings, there does not seem to be justification for the wide variation in specifications now used by different carriers for parts subjected to similar service.

The service to which tire chains are subjected involves resistance to both impact and wear. A special wear test for this purpose is described by W. H. Parker (Am. Soc. Testing Mats., *Proceedings*, vol. 28, II, 1928) which rates various chain materials in practically the same order as road tests, while giving a much greater distinction between them and furnishing a relatively quick means for comparing different materials and heat treatments.

The wearing qualities of flooring materials have heretofore received very little attention by testing engineers and none of the testing devices in present use seem well adapted to such determinations. Due to the outstanding need for data on wear resistance of such materials as marble, limestone, slate and various composition flooring materials, D. W. Kessler (Am. Soc. Testing Mats., *Proceedings*, vol. 28, II, 1928) has worked out a simple abrasion apparatus in which the various testing conditions can be closely controlled. Comparison of his abrasion test results with results of service tests on identical materials shows a fair agreement and indicates that the testing apparatus gives valuable information as to wearing qualities. Some evidence was developed that certain properties other than abrasive hardness, such as toughness, strength and textural variation, may influence the wearing qualities under service conditions.

Particle Size Determination.—Interest in determining the fineness of crushed or precipitated aggregates such as ground minerals, pigments, fuels and cements is of wide extent and great diversity. Particular emphasis has been laid recently on methods for testing powders which are primarily of less than sieve mesh. Fineness tests are of two types: direct measurement and indirect comparison. By actual observation, the direct methods measure the amounts of material of each size and they should be regarded as standards of reference. By the measurement of some property which varies with fineness, the indirect methods give in a single value an estimate of the degree of fineness, but they should be checked for accuracy by the direct method. These methods are usually rapid and often are a more useful measure of the property of the material than a fineness curve obtained by direct measurement. Sieving, elutriation and microscopic sizing are three methods that cover the range of sizes from a few tenths of a micron upwards, each having special advantages in certain size ranges. (L. T. Work, American Society Testing Mats., *Proceedings*, vol. 28, II, 1928).

Sperry Rail Tester.—Of especial interest to railway engineers is the development of an apparatus which when drawn over railroad track will detect transverse fissures in rails, mark them on a chart and spot the rail with paint to indicate the location (Am. Railway Engr. Assoc., *Transactions*, 1928). The method consists in forcing a high current at low voltage through the rail and by continuously moving a set of conductors along the rail length energize the entire rail. The resistance effect of discontinuities in the head is detected by a pair of brushes, which picks up this minute potential and transmits it to radio amplifying tubes to increase the impulse sufficiently to actuate pins through relays for a permanent paper record. With this device it is possible to detect internal breaks having an area of only 2 per cent of the head area.

Stevenson Creek Arch Test Dam.—The building and testing of the Stevenson Creek Arch Dam in California was a remarkable piece of pioneer work on the part of the Committee on Arch Dam Investigation of the Engineering Foundation and is unique in the sense that it is the greatest piece of "full-size" testing yet undertaken. Measurements were made of tensile and compressive strains, deflections, temperatures, and

movements of abutments and foundations under varying heads of water, using several different instruments for the direct or indirect measurement of strains. Of these, the clinometer, the strain gauge and the electric telemeter (see THE AMERICAN YEAR BOOK, 1927, p. 583) were about equally useful. The bending and direct strains could be determined by any two of them alone, but there were certain places and functions for which each of the three instruments were particularly well adapted.

Testing Apparatus.—Many of the advances in the study of materials have been made possible by the continued evolution in the design and development of testing and control equipment. Many new machines and testing instruments have been developed, some of them operating on wholly new principles, while others represent radical improvements of older designs. The tendency toward greater precision and automatic control features is quite marked.

Commercial Testing.—The growth of commercial testing merits a word in this review. Undoubtedly purchasers of materials and commodities are to an increasing extent buying to specifications and resorting to testing to determine whether deliveries are in accord with specified requirements. This has stimulated the business of testing and inspection, and it is of interest to note that there is considerable demand for the List of Commercial Testing and College Research Laboratories compiled by the National Bureau of Standards. This development will be of particular advantage to those groups of buyers who do not have testing and inspecting facilities of their own, which includes the large group of relatively small users who heretofore have not enjoyed the full benefits of purchase by quality specifications.

INDUSTRIAL STANDARDIZATION

By P. G. AGNEW

SECRETARY, AMERICAN STANDARDS ASSOCIATION

PROGRESS AND STUDY

Interest in Movement Grows.—A year of healthy growth of the national industrial standardization movement has been particularly noteworthy for the increased recognition of the importance of standardization as a part of the managerial policy of manufacturing organizations and for the greater interest in the movement on the part of distributors and consumers. The increasing number and the growth of organized trade groups of many types which consider standardization in their field of prime importance is also resulting in greater impetus to the entire movement. Trade associations, consumers' groups of various sorts, and organizations in the field of distribution are entering into the national standardization movement more and more each year.

National Industrial Conference Board.—It is significant that a comprehensive study of the whole industrial standardization movement is being made by the National Industrial Conference Board, and will appear shortly. Unquestionably the report will be written for and from the point of view of management in industry, as are the other studies of the Board. It is understood that it will contain a critical descriptive outline of the organizations playing a significant rôle in the movement, their work and inter-relations. There will also be included a survey of the material available on the economic effects of standardization, together with a discussion of it as a tool for managerial control. It is evident that the report will be read with the greatest interest, since there has been a long-felt need for such an authoritative treatment of the subject as the Board is qualified to present.

Organized National Movement.—Also significant of the integrating changes now taking place in the move-

ment and in the attitude of management toward it is the reorganization, during the past year, of the American Standards Association (A. S. A.), originally started by five engineering societies under the name of American Engineering Standards Committee. This body, acting as the centralizing agency for industrial standardization in the United States, has been reconstructed so as to place industrial executives in general direction of the movement, while extending participation in the technical development of standards to a broader field of trade groups.

American Standards Association.—There are literally thousands of organizations in the United States today which are engaged to some extent in the development of standards. The coördination of all of this work and the development of a consistent set of national standards is the task of the American Standards Association. The original organization, which was founded in 1918, had developed in the course of ten years into a federation of thirty national associations with over three hundred and fifty national bodies coöperating in its work. More than three hundred national standardization projects have been handled by the Asscoiation. As a result of reorganization, the Association's administration is now vested in a Board of Directors composed of twelve industrial executives, while the approval of national standards and matters relating to the technical development of standards is in the hands of a body of engineers known as the Standards Council which includes in its membership representatives of all of the member-bodies of the Association.

Correlating Committees.—To facilitate coördination in the major fields, there are in operation what are known as correlating committees. These committees are constituted for the electrical, mining and mechanical industries, and for the safety field. The correlating committee for the mechanical industries, containing official representatives of some forty trade associations, was organized during 1928.

Types of Standards.—Several different types of standards are under development, the principal ones being: 1. Nomenclature, definitions of technical terms used in specifications and contracts. 2. Uniformity in dimensions necessary to secure interchangeability of parts and supplies. 3. Quality specifications for materials and equipment. 4. Methods of test. 5. Ratings of machinery and apparatus. 6. The codifying of provisions for safety. 7. Rules for the operation of apparatus and machinery. 8. Concentration upon the optimum number of types, sizes, and grades of manufactured products.

Coöperative System.—The method of work is simply a systematic plan of coöperation by which organizations interested in any particular project participate (1) in deciding whether the work shall be undertaken at all, (2) in formulating the standard, and (3) in its ultimate approval as an "American Standard." One of the most important results of the reorganization is the more flexible procedure for adopting standards now available.

THE PROBLEM OF THE ULTIMATE CONSUMER

Standards Laboratories. — Steps have been taken by some of the larger department stores and mail order houses to provide laboratories to investigate the possibilities of the use of specifications and standards in increasing their customers' confidence and good-will. These laboratories appear to be in a rather rudimentary stage at present, although one of the mail order houses has a well-equipped laboratory of some years successful experience, but they indicate the lines upon which a tremendous volume of work, better planned and better coordinated, will undoubtedly be done within the next few years.

New Projects.—Further examples of the extension of standardization to fields of direct concern to distributors and ultimate consumers are three new national standardization projects on which work was started during the past year. These are specifications for household refrigerators,

for bed sheets and for plumbing equipment. The first two, it is interesting to note, were initiated at the request of the American Home Economics Association, an organization which is now working actively to make the benefits of standardization available in the home. This professional organization of 9000 home economists considers that it is broadly representative of the consumers' point of view, and has available through its membership sufficient technical knowledge to enable it to take an active and effective part in the development of technical standards and specifications for many ultimate consumer goods. Coöperating in A. S. A. standardization work of this type are such organizations as the National Retail Dry Goods Association, National Association of Purchasing Agents, American Hospital Association, American Hotel Association, National Association of Real Estate Boards, National Association of Master Plumbers, Laundryowners' National Association, and the American Institute of Food Distribution.

Another matter under discussion by a large group of interested organizations is the possibility of bringing about a set of nationally recognized specifications for the materials and workmanship entering into one- and two-family houses. While no formal action has yet been taken to start active work on such a group of projects, the indications are that some such program may be initiated, as real estate financing bodies have shown a keen interest in improving the basis on which money is advanced to home builders on mortgages. Should such a program develop, it will demonstrate the benefits of industrial standardization in a very concrete way to millions of home owners, since standards for dwelling construction will tend not only to improve the house, and extend its life, but also to increase very considerably the amount that will be lent on first mortgage on a given dwelling.

STANDARDIZATION IN AGRICULTURE

Foodstuffs and Tobacco.—The development of standards in the field of agriculture has made considerable progress in the past year. Permissive standards have been issued for such diversified products as slaughter vealers, honey, and bunched shallots, and tentative standards for 19 different types of tobacco have been placed in use. The United States standards for beans, issued in 1926, were officially adopted by the States of Idaho, Montana and Wyoming, and are being applied at shipping points by Federal licensed inspectors under coöperative agreements with these States. Although the application of these standards is still in its infancy, their value is being increasingly recognized by growers, distributors and commercial consumers. Tentative standards are being prepared for canned foods in connection with the administration of the U. S. Warehouse Act.

Wool and Cotton.—Improvement in the quality and preparation of wool has resulted from the adoption of the standards for wool in this country, and this adoption has had important consequences in other wool producing and consuming countries. Endorsement of the official wool standards at the Pan-American Standardization Conference in 1927 was followed by recommendations to the South American countries that each country adopt and use the wool standards. The Universal standards for American cotton have been approved of by representatives of the European cotton exchanges.

Meat.—Some standards for meat have been officially promulgated by the Secretary of Agriculture, while others are as yet tentative in character. A system of grading and branding has met with approval, and there have been many requests that the practice be extended as a guarantee of quality. This grading work has wholly to do with quality and is entirely apart from inspection from the health point of view.

ACTIVITIES OF THE FEDERAL GOVERNMENT

Federal Specifications Board.—There are two important aspects of the Government's interest in standardization work, first, as a large con-

sumer, and second as an aid to industry through the activities of the great research and service bureaus. In the first of these, the Federal Specifications Board, organized in 1921, has succeeded in unifying specifications for the more important commodities used in two or more departments. Departure from usual commercial practice in many of these specifications has lead to spirited discussions with industrial groups. While considerable coöperation with industrial groups has been maintained, to a considerable extent through the American Standards Association, it is only during the last year that an effort has been started to bring such specifications into complete agreement with American Standards. This has been done through the formal submittal of a few of the specifications by the Board to the American Standards Association for approval as American Standards.

Bureau of Standards.—All of the industrial standards activities of the Bureau of Standards, which are carried on as a service to industry, are now joined under the Bureau into what is known as the Commercial Standards Group. This includes the Division of Simplified Practice, which formerly functioned in connection with the office of the Secretary of Commerce, the Commercial Standards Unit, which assists industry in the development of "Commercial Standards" (in contradistinction to standards for the use of the Government itself), and the Division of Specifications. An attempt is now being made to limit the work of the Division of Simplified Practice closely to the elimination of types, ranges and sizes of products, the decision being made primarily on sales records. The Commercial Standards Unit deals with industrial standards along lines very similar to that of the American Standards Association. The two organizations are working out a cooperative program to minimize duplication with its confusing effects upon industry. While no announcement of the relationship has been made, the basis of it is that "Commercial Standards" promulgated by the Bureau be considered as temporary standards developed to meet an immediate situation, which become thereby automatically candidates for development into "American Standards" approved by the American Standards Association.

The Division of Specifications, which grew out of the work on the National Directory of Commodities Specifications issued in 1925, has started the republication of related groups of specifications. Another very interesting experiment which is being developed is the "Certification Plan," under which the Bureau compiles and issues lists of "willing-to-certify" manufacturers, by which is meant that these manufacturers agree in advance that, when requested to do so, they will tender goods in compliance with recognized specifications. So far the work has been based exclusively on government specifications.

INTERNATIONAL STANDARDIZATION

Aims of International Federation.—The movement towards definite organization of international standardizing bodies, which had been launched in New York in 1926, and in which eighteen countries participated, resulted in the authorization of an International Federation of National Standardizing Bodies (I. S. A.) at a meeting held in Prague, Czechoslovakia, in November, 1928. According to its statutes, the aims of the I. S. A. are: (a) to lay the groundwork for international agreement upon standards, by providing simple systematic means of interchanging information on the standardization work and activities in the different countries; (b) to develop general guiding principles for the assistance of the standardizing bodies; (c) to promote uniformity among the standards of the various national bodies. For the present it is not intended to set up international standards. Offices of the I. S. A. have been established at Zurich, Switzerland. Sixteen of the twenty countries having national standardizing bodies have agreed to join the new organization. The British national body has lately withdrawn from participation in the work, and the adherence of

the American Standards Association awaits action by its newly organized Board of Directors.

The International Illumination Congress held its third and final series of meetings at Saranac, N. Y., on September 22-28, 1928. Representatives from eleven foreign countries participated in discussions dealing with street lighting, automobile headlights, natural lighting, lighting education, colored signal glasses, diffusing materials, etc.

International Electrochemical Commission.—Arrangements have been made for an important meeting of the International Electrochemical Commission in Europe early in 1929 to deal with the whole subject of the rating of electrical machinery.

COMMERCIAL AVIATION

By Archibald Black

President, Black & Bigelow, Inc., Air Transport Engineers

AERONAUTICAL EXPANSION

Technical Developments.—During the year 1928 the most important development in Aeronautics was undoubtedly the tremendous growth of the business in the United States. This growth has been so substantial and so rapid that it overshadowed parallel technical developments in the same period. However, several important technical developments took place throughout the world during 1928. One of these was the transatlantic crossing by the Graf Zeppelin, the first post-war airship of this type to be built specifically for commercial service. The La Cierva Autogyro,—a modified type of helicopter, —which had been undergoing development for several years past, broke into the headlines this year by successfully crossing the English Channel. The Handley Page slotted wing mechanism, also a development of a few years' standing, came into further use this year through its adoption on some commercial and military airplanes.

Air Mail Traffic.—As just intimated, it has been under the head of commercial air transport in the U. S. A. that the most spectacular development has taken place. Some conception of the importance of this development may be gained from study of the tabulated data on air mail operations included herewith. These figures are not available in complete form until a few months after the end of each period. Hence the table is carried only up to June 30th but the figures on volume of traffic for some of the subsequent months show that the growth is continued. On August 1st a reduced rate went into effect, and resulted in a further violent increase of mailings which almost doubled the volume within a period of 30 days. These increases have not shown the slightest tendency to slow up,—indeed, the tendency seems to be toward still further growth. One of the technical aspects of air mail operation has been the recent tendency towards higher speed. Some recent mailplanes are capable of maintaining a schedule of 110 miles per hour.

Passenger Services.—Partly through the generally increased interest in aviation and partly through the improvement in revenues due to increase in air mail, many of the aircraft operators in this country have given more attention to passenger carrying. Passenger carrying is the one phase of aeronautics in which Europe has generally been ahead of the United States and this condition has given rise to a rather erroneous impression of backwardness which was not borne out by actual facts. Now several very successful passenger routes are in operation here and their growth is making such progress as to indicate a duplication of what has been accomplished in carrying of mail. It is most encouraging to observe that most of the financially successful airplane routes in the

world are operated within or to and from the United States. As a natural result of passenger traffic development here, a tendency towards larger capacity airplanes has been started and some recent designs seat up to 20 passengers.

Commercial and Private Flying.—The most direct effect of the transoceanic flights of 1927 and 1928 has been to develop public interest in private flying, and their effect on use of airplanes for personal use has undoubtedly exceeded their effect upon air Transport. In developing private, as well as transport and other commercial flying, in this country, considerable credit should be given also to the Aeronautics Branch of the Department of Commerce and to the Guggenheim Fund for Promotion of Aeronautics. The effect of the Lindbergh and other flights was to create public interest; it has been the work of the Department of Commerce and the Guggenheim Fund to convert this interest into action. As a result of all of these influences (combined of course with the natural growth which started several years ago) there has recently been a very important increase in the sales of airplanes, the activities of flying services, and in the registrations in flying schools. Aviation Country Clubs are now being organized among sportsmen throughout this country, for the purpose of combining the features of the country club with those of the older type of flying club. This is a distinctly new development, just getting under way, from which much may be expected.

Airports and Lighting.—The design and construction of airports is now developing as a specialized branch of engineering, most particularly in the United States of America, where several companies engage in this work, sometimes even to the exclusion of any other. The number of airports here has undergone a rapid increase and the latest official figures which are available list 367 municipal; 331 private or commercial; 256 equipped intermediate (Dept. of Commerce); 79 military and 326 marked auxiliary fields or a total of 1,359 landing fields already available in the United States, while another 754 sites are under consideration for development. Equipment for aviation lighting has undergone some further improvement but the chief feature in this branch of activity has been the increased interest and the rapid growth of lighted airways and airports.

MILEAGE AND TRAFFIC STATISTICS FOR PRIVATELY OPERATED AIR MAIL ROUTES WITHIN THE U. S. A., FOR YEAR ENDING JUNE 30, 1928

(Compiled from Post Office Department figures)

Date	Pounds of Mail Carried	Mail Revenue to Operator	Airplane Miles Flown with Mail
July, 1927	99,589	$ 250,891	375,923
August	102,051	258,963	376,998
September	146,486	312,810	444,519
October	153,649	329,532	449,562
November	141,992	304,083	413,054
December	165,768	353,253	402,267
January, 1928	144,289	300,281	431,310
February	153,363	329,380	450,058
March	173,929	368,191	523,287
April	171,028	359,182	513,144
May	199,409	425,565	616,179
June	210,957	447,642	595,054
Totals for year	1,862,510	$4,039,773	5,591,355
Increase over previous years	265%	205%	115%

AIR TRANSPORT MILEAGE OF THE WORLD

Operations of Scheduled Services in Airplane Miles Over 12 Month Periods as Nearly as Possible Comparable

(Compiled by Black & Bigelow, Inc., New York, N. Y.)

Country of Registry	1919	1920	1921	1922	1923	1924	1925	1926	1927
Australia					235,582	262,895	352,847	417,964	¶
Austria									245,043
Belgium						160,000	144,500	¶	¶
Canada						294,778	446,648‖	631,715‖	¶
Colombia		2,687	53,650	125,678	184,375	169,500	183,206	¶	¶
Czechoslovakia						126,400	48,300	170,895	257,888
Denmark					56,000		114,500	126,730	116,798
France		505,500	1,460,000	2,015,000	2,115,000	2,249,000	2,946,000	3,243,900	3,755,369
Germany				842,986	885,881	1,860,000*	3,070,000	3,816,144§	5,921,593
Great Britain	168,000	599,000	259,000	778,000	1,004,000	890,000	865,000	840,000	873,000
Italy									824,474
Mexico								96,800	146,400
Netherlands		50,850	217,000	246,200	336,000	482,800	679,753	597,500	813,510
Poland				66,293	142,057	233,923†	465,847	¶	654,873
Soviet Russia						288,600	292,595‡	311,000‡	¶
Sweden						69,280	248,610‡	222,000	206,766
Switzerland						268,400*	87,427	210,340	459,720
United States	393,066	880,028	1,828,354	2,329,296	1,743,030	2,220,761	2,910,611	4,407,263	6,009,226
	561,066	2,038,065	3,818,004	6,403,453	6,701,925	9,576,337	12,855,844	15,092,251	20,284,660

* Figure uncertain or known to include duplication. † Revised figures. ‡ Incomplete. § All services suspended for 3 months. ‖ Including some non-scheduled flying. ¶ Figures not on hand.

RECENT OUTSTANDING WORLD RECORDS

(Compiled by the National Aeronautic Association)

BALLOONS

Duration (Germany).
H. Kaulen, Dec. 13-17, 1913, 87 hours.

Distance (Germany).
Berliner, Feb. 8-10, 1914, 3052.7 kilo. (1896.9 miles).

Altitude (Germany).
Suring and Berson, June 30, 1921, 10,800 meters (35,424 feet).

AIRPLANES

Returning to Point of Departure Without Refueling

Duration (Germany).
Johann Risztics and Wilhelm Zimmerman, Junkers W-33, Junkers LV, 280 hp., at Dessau, July 5, 6, 7, 1928, 65 hours 25 minutes.

Distance (Closed Circuit) (Italy).
Arturo Ferrarin and Carlo Del Prete, Savoia-Marchetti S-64, Fiat A-22, Course Casale dei Prati, Torre Flaria Fara, d'Anzio, May 31-June 1-2, 1928, 7666.6 kilo. (4763.7 miles).

Distance (Airline) (Italy).
Arturo Ferrarin and Carlo del Prete, Savoia-Marchetti S-64, Fiat 550 hp., Rome to Touros, Brazil, July 3, 4, 5, 1928, 7188 kilo. (4466 miles).

Altitude (United States).
Lt. C. C. Champion, U.S.N., Wright "Apache," Pratt & Whitney "Wasp," Supercharged, 425 hp., at Anacostia, D. C., July 25, 1927, 11,716 meters (38,418 feet).

Maximum Speed (France).
Warrant Officer Bonnett, Ferbois monoplane, Hispano Suiza, 550 hp., at Istres, France, Dec. 11, 1924, 448.171 k.p.h. (278.480 m.p.h.).

REFUELING IN FLIGHT

Returning to Point of Departure

Duration (Belgium).
Adj. Louis Crooy and Sgt. Victor Groenen, DH-9, Siddeley-Puma at Tirlement, June 2, 3, 4, 1928, 60 hours 7 minutes.

RECORDS FOR LIGHT AIRPLANES

Two Seaters Weight Empty Less Than 400 Kgs. (881 Lbs.)

Distance (Closed Circuit) (Czechoslovakia).
Joseph Hermansky and Francois Machacek, Avia BH-9, Walter 60 hp. at Prague, July 11, 1928, 1500 kilo. (932 miles).

Single Seaters Weight Empty Less Than 200 Kgs. (440 Lbs.)

Distance (Closed Circuit) (Hungary).
Chas. Kaszala, Lanipich, monoplane Thorutzkai engine, 18 hp. at Budapest, Sept. 14, 1927, 650 kilo. (403.9 miles).

SEAPLANES

Returning to Point of Departure without Refueling

Distance (United States).
Lts. B. J. Connell and H. C. Rodd, PN-10, 2 Packard 600 hp. ea., at San Diego, Cal., Aug. 15, 16, 1927, 2525 kilo. (1569 miles).

Duration (United States).
Lts. Arthur Gavin and Zeus Soucek, Navy PN-12, 2 Wright R-1750, 525 hp. ea., at Philadelphia, May 3, 4, 5, 1928, 36 hours 1 minute.

Distance (Airline) (United States).
Comds. John Rodgers, U. S. N., and Lt. B. J. Connell, PN-9, 2 Packard 1-A-1500, 500 hp. ea., San Pablo Bay, Cal. to near Hawaii, Aug. 31-Sept. 1, 1925, 2963 kilo. (1841 statute miles).

Altitude (United States).
Lt. C. C. Champion, U.S.N., Wright "Apache," Pratt & Whitney "Wasp," Supercharged, 425 hp., at Anacostia, D. C., July 4, 1927, 11,581 meters (37,995 feet).

Maximum Speed (Italy).
Major Mario de Bernadi, Macchi 52, monoplane, Fiat engine Type AS3, at Venice, Italy, Mar. 30, 1928, 512.776 k.p.h. (318.624 m.p.h.).

AMERICAN MACHINERY INDUSTRY

By W. H. Rastall

Chief, Industrial Machinery Division, Bureau of Foreign and Domestic Commerce

ECONOMIC CONSIDERATIONS

Volume Production.—For two or three years American business has been reconsidering the matter of volume production. Heretofore many manufacturers have felt that by adopting a policy of "large turnover at narrow margins" they could insure the future of their business and also show profits that would represent an attractive investment. However, it is obvious that if a sufficient number of

competitors in a given line adopt this policy we will have excessive competition and unsatisfactory profits in general. This is perhaps the origin of the existing "profitless prosperity." A careful study of the income tax returns reveals how this has been affecting the American machinery industry.

Progress and Prosperity.—Since machinery is required in every industry it is clear that the general welfare is unusually dependent upon the prosperity of the machinery industry. In a unique sense the public is interested in seeing that the machinery industry as a whole is prosperous. Through the development of improved designs, creation of labor-saving machinery and the development of new manufacturing methods which are constantly reducing costs, the machinery industry proves itself the instrument by which all other industry prospers. This progress is being accelerated from year to year, the progress of the last ten years being undoubtedly far greater than for any previous decade. So far as mere volume of business is concerned, 1928 has undoubtedly been a most prosperous year for the machinery industry, certainly exceeding anything since 1920, and perhaps being the most prosperous year in all history.

Utility Gains.—The adoption of frictionless bearings makes more rapid production possible and also more accurate production because of the close tolerances represented in these bearings. Woodworking machinery is operating at much higher speeds and more accurately. The development of special cutting steels is making necessary a new designing of practically all types of machine tools. Improved fire-room equipment has increased the efficiency of our boiler plants and this list could be extended indefinitely. In a general way it may be taken as a rule that prewar machinery has now become obsolete and the machinery manufacturers of the country are called upon to reëquip our factories, our mines, and our construction crews.

PROFIT EXPERIENCE

Past Income Tax Showing.—A study of income tax returns reveals that the industry as a whole is not prosperous; for example, in 1924 more than one-half of the machine tool manufacturers of the country operated without profit and as was also the case with our marine and

FIRMS REPORTING NO PROFIT

(Income tax year 1924)

Class: Metal Machinery	Percentage of No Profit	Dollars Profit Entire Industry
Locomotives	37.0	$ 9,378,338
Stationary engines, boilers, etc.	37.9	2,087,189
All other engines, marine, gas, etc.	51.6	1,531,866
Electrical machinery and supplies	43.2	112,975,306
Textile machinery	45.9	8,223,700
Machine tools and metal-working machinery	51.8	3,032,672
Leather-working machinery	48.0	7,980,059
Paper-making machinery	31.7	1,912,484
Printing machinery	33.1	11,013,379
Woodworking machinery	27.3	2,912,824
Construction, building and excavating machinery	40.0	19,609,595
Machinery used in food production	50.5	8,872,406
Mining and oil well machinery	49.0	5,966,573
All other machinery used in factories	50.5	3,203,990
Agricultural machinery and equipment	54.2	8,145,406
Railway equipment	32.9	39,939,087
Office and business equipment	39.4	24,665,885
Building materials and supplies	34.0	29,448,220
Gas-making machinery	43.8	3,408,325
All other machinery and equipment used by producers	35.7	74,361,793
Household machinery and equipment	41.4	93,370,998
Motor vehicles and accessories	57.0	287,178,069
Airplanes and spare parts	54.9	878,512

gas engine builders. In fact, in this latter group the average net profit earned per corporation was little in excess of $10,000. The most profitable group appears to have been the woodworking machinery industry where 72.7% of the corporations reported profit and yet, even in this industry, the average profit per corporation was less than $23,000.

The table on page 645 derived from the income tax returns for 1924 gives the experience of the entire machinery industry. While, of course, we should not expect 100% of these corporations to show a profit, we do find some difficulty in arriving at a percentage of unprofitable operation that could be considered healthy, but since this table reveals that some 40 to 50% of the machinery manufacturers of the country are operating without profit we have a condition that can safely be described as unhealthy and uneconomic.

Later Comparative Data.—The data for 1924 have been used because the Treasury Department has not subsequently published its returns in the above form and consequently it is impossible to secure such detailed information. The volume of machinery manufactured and sold in this country in 1925 was greater than in 1924; 1926 was an improvement upon 1925 and so on down through 1928 which represented the largest volume of all. The latest detailed information in the Income Tax Unit covers 1926 when something like 40% of the machinery manufacturers of the country are shown as operating without profit. Also, the net profit appears to be less than 10% of the gross turnover. Details are shown in the following table:

Industries	Total Number of Returns 1924	Total Number of Returns 1926	Number of Companies Reporting No Net Income 1924	Number of Companies Reporting No Net Income 1926
Metal Manufacture				
Products of blast furnaces, steel mills and rolling mills	2,922	3,929	1,003	1,279
Locomotives and railroad equipment	218	244	73	99
Motor vehicles and accessories	1,671	1,753	954	927
Electrical machinery and equipment	1,553	1,743	672	787
Household machinery and equipment	1,320	1,262	547	560
Factory machinery, textile, paper, printing presses, machine tools, etc	1,764	1,848	816	717
Building materials and supplies	1,200	1,325	409	511
Agricultural machinery and equipment	514	565	279	283
All other machinery, stationary, marine, gas, mining and oil-well machinery, office machinery, etc.	3,003	5,285	1,238	2,086
Metal and metal products, other than iron and steel, refining of precious metals, manufacturing jewelry, etc	1,728	2,100	716	816
All other manufactures, airplanes, optical products, musical instruments, metal processes, etc.	4,760	8,755	2,480	4,074
Total	20,170	28,809	8,943	12,139
Total, 1927	27,044		12,211	

So far as 1927 is concerned as yet preliminary returns only have been made available, but these suggest that in spite of the large volume of business moving, it has been even less profitable, with a larger percentage of companies reporting no net income.

Influence of Patent Protection.—In presenting these returns the Income Tax Unit obviously combines the reports of all manufacturers, some of whom enjoy more liberal profits than the average and in general these are probably the firms that are manufacturing patented machinery, being

thereby protected from general competition and because of this monopolistic position, securing the better profits. If it were possible to subtract the returns of these profit-making companies from the above total we might be forced to the conclusion that a point has now been reached where machinery manufacturers exposed to unrestricted competition are unable to secure a profit greater than would be represented by bond interest on their invested capital.

WORLD POSITION IN MACHINERY

American Predominance.—This situation is the more unfortunate because the American machinery industry far surpasses that of any other country. We make here about 57% of the world's total production of machinery; Great Britain and Germany, usually considered our leading competitors, only produce about 13% each, giving the American industry a predominance on mere volume of about 4½ to 1, but in addition to all this there is a predominance on the score of quality. Generally speaking, American machinery is distinguished for its superior quality and the better engineering that it represents. Public welfare requires that we continue to maintain this position of leadership, but obviously, this will be difficult unless our machinery manufacturers discover a way to secure profit margins that will provide the sinews of this commercial war. New designs should be developed every year or so, and this requires research and heavy development charges, items which should be absorbed as a general business expense, but which obviously are not being absorbed with conditions as above described.

Percentage of Companies Reporting No Income 1924	Percentage of Companies Reporting No Income 1926	Total Gross Income 1926 (No figures for 1924)	Total Net Income Less Deficit 1924	Total Net Income Less Deficit 1926	Percentage of Profit Earned *vs.* Total Gross Income 1926
40.40	32.55	$ 3,771,951,754	$ 221,158,281	$ 341,757,227	.09 +
35.50	40.57	651,904,281	49,317,425	51,543,240	.08 —
57.00	52.88	5,291,130,721	287,178,069	442,293,343	.08 +
43.20	45.15	1,442,163,566	112,975,306	144,184,869	.10 —
41.40	44.37	738,733,608	92,370,998	77,340,214	.10 +
46.25	38.79	834,621,468	47,151,514	85,701,662	.10 +
34.00	38.56	836,569,630	29,448,220	71,064,157	.08 +
54.20	50.08	553,924,211	8,145,406	53,235,085	.09 +
41.22	39.47	2,611,058,519	131,631,226	228,424,783	.08 +
41.43	38.85	1,721,817,330	86,945,686	115,325,172	.06 +
52.10	46.53	2,526,635,147	28,496,116	150,152,695	.06 —
44.33	42.13	$20,980,509,983	$1,095,818,248	$1,761,022,439	.08 +
45.15		$18,228,138,334		$1,067,141,999	.06 —

THE EXPORT SITUATION

So far American machinery has maintained its leadership. Machinery exports in 1928 will approximate $200,000,000, which is by far the best showing since the collapse of the post-armistice boom. In fact, this volume has never been exceeded except in the years 1919, 1920 and 1921, when conditions were abnormal. Furthermore, our principal competitors are also our best customers. Great Britain is taking about $25,000,000 annually; Germany about $7,000,000, but we cannot expect this condition to continue unless the industry finds its way to

more healthy operation. In fact, German manufacturers are boasting that German shipments of machinery to the United States are already in excess of American shipments of machinery to Germany, a statement that is true if quantities be measured by weight rather than by value.

TRADE ASSOCIATION ACTIVITIES

The above data explain why it is that the year 1928 has been very active among the machinery trade associations. Manufacturers have come to realize that there have been many trade abuses tolerated in the machinery industry and steps are now being taken to eliminate these by means of "Codes of Ethics" among the trade associations and "Trade Practice Submittals" before the Federal Trade Commission. The industry as a whole is making a strenuous effort to police itself, which is in line with the Government policies advocated at present.

COGNATE SOCIETIES

ALLIED BUILDING METAL INDUSTRIES.—25 W. 33rd St., New York, N. Y.

AMERICAN CERAMIC SOCIETY.—2525 N. High St., Columbus, O.

AMERICAN CONCRETE INSTITUTE.—2970 W. Grand Blvd., Detroit, Mich.

AMERICAN CONSTRUCTION COUNCIL.—28 W. 44th St., New York, N. Y.

AMERICAN ENGINEERING STANDARDS COMMITTEE.—29 W. 39th St., New York, N. Y.

AMERICAN FOUNDRYMEN'S ASSOCIATION.—140 S. Dearborn St., Chicago, Ill.

AMERICAN INSTITUTE OF CHEMICAL ENGINEERS.—85 Livingston St., Brooklyn, N. Y.

AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS.—33 W. 39th St., New York, N. Y.

AMERICAN INSTITUTE OF MINING AND METALLURGICAL ENGINEERS.—29 W. 39th St., New York, N. Y.

AMERICAN INSTITUTE OF RADIO ENGINEERS.—37 W. 39th St., New York, N. Y.

AMERICAN IRON AND STEEL INSTITUTE.—40 Rector St., New York, N. Y.

AMERICAN RADIO RELAY LEAGUE, INC.—1711 Park St., Hartford, Conn.

AMERICAN RAILWAY ENGINEERING ASSOCIATION.—431 S. Dearborn St., Chicago, Ill.

AMERICAN ROAD BUILDERS ASSOCIATION.—Press Building, Washington, D. C.

AMERICAN SOCIETY FOR STEEL TREATING.—4600 Prospect Ave., Cleveland, O.

AMERICAN SOCIETY FOR TESTING MATERIALS.—1315 Spruce St., Philadelphia, Pa.

AMERICAN SOCIETY OF CIVIL ENGINEERS.—33 W. 39th St., New York, N. Y.

AMERICAN SOCIETY OF HEATING AND VENTILATING ENGINEERS.—29 W. 39th St., New York, N. Y.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS.—29 W. 39th St., New York, N. Y.

AMERICAN SOCIETY OF MUNICIPAL ENGINEERS.

AMERICAN SOCIETY OF NAVAL ENGINEERS.—Navy Department, Washington, D. C.

AMERICAN SOCIETY OF REFRIGERATING ENGINEERS.—35 Warren St., New York, N. Y.

AMERICAN SOCIETY OF SAFETY ENGINEERS.—25 W. 39th St., New York, N. Y.

AMERICAN STATISTICAL ASSOCIATION.—114 Woodward Bldg., Washington, D. C.

AMERICAN WELDING SOCIETY.—25 W. 39th St., New York, N. Y.

BUILDING TRADES EMPLOYERS' ASSOCIATION.—34 W. 33rd St., New York, N. Y.

COMMITTEE ON EXPERIMENTAL POWER.—2 Rector St., New York, N. Y.

ENGINEERING FOUNDATION.—29 W. 39th St., New York, N. Y.

ILLUMINATING ENGINEERING SOCIETY.—29 W. 39th St., New York, N. Y.

INTERNATIONAL ASSOCIATION OF ELECTRAGISTS.—15 W. 37th St., New York, N. Y.

INVENTORS' LEAGUE OF THE UNITED

States.—114 Maiden Lane, New York, N. Y.

Metric Association.—156 Fifth Ave., New York, N. Y.

National Aeronautic Association.—1623 H. St., N. W., Washington, D. C.

National Electric Light Association.—29 W. 39th St., New York, N. Y.

National Fire Protection Association, Boston, Mass.

New York Electrical Society.—29 W. 39th St., New York, N. Y.

Radio Engineers Association of America.—9 Church St., New York, N. Y.

Society for Promotion of Engineering Education.—25 W. 39th St., New York, N. Y.

Society of Professional Automobile Engineers of the U. S.—153 W. 64th St., New York, N. Y.

Society of Automotive Engineers, Inc.—29 W. 39th St., New York, N. Y.

Society of Naval Architects and Marine Engineers.—29 W. 39th St., New York, N. Y.

DIVISION XX

GEOPHYSICAL SCIENCES

DYNAMIC AND STRUCTURAL GEOLOGY

By Kirtley F. Mather

Professor, Harvard University

OBSERVATIONS AND DEDUCTIONS

Trend to Precision.—The year has witnessed a continuation of the trend toward greater precision in geological observations and deductions. The qualitative studies of the past, with their glittering generalities, are giving place to quantitative examinations leading to sharply defined and accurately detailed conclusions. This involves not only more precise measurements of geological processes now in operation or simulated in the laboratory. but also the increasing use of mathematical principals and quantitative physics in the deductions based upon observations.

Glacier Motion.—R. T. Chamberlin, for example, reports the results of observations made with self-recording clockwork apparatus upon the motion of glaciers ("Instrumental Work on the Nature of Glacier Motion"; *Jour. Geol.*, vol. 36, pp. 1-31, 1928). These automatic records show that slipping takes place along definite shearing planes, at times gradually and at other times by distinct jumps. The capacity to withstand a certain amount of growing stress before yielding is indicated. The results speak definitely for the solidity and elastic rigidity of moving glacier ice, and decisively against liquid or viscous flow.

Mountain-making Forces.—Theoretic and experimental data have been presented by M. K. Hubbert (*Jour. Geol.*, vol. 36, pp. 75-85, 1928) which afford means of determining to within a quadrant of arc or less, the direction of the stress which has caused a given deformation, and whether the strain has been rotational or non-rotational. R. W. Brown has devised laboratory experiments which simulate the horizontal movement of the earth's crust along buried fault planes. The experiments resulted in the development of shear, thrust and tension faults as well as elongated folds not unlike those which are of great importance in several of the oil fields of the world ("Experiments Relating to the Results of Horizontal Faulting"; *Bull. Amer. Ass'n. Petr. Geol.*, vol. 12, pp. 715-721, 1928). T. A. Link (*Jour. Geol.*, vol. 36, pp. 526-539, 1928) has similarly produced in échelon folds and miniature arcuate mountain systems. As a result of his laboratory experiments, certain principles of mountain making may now be applied to specific portions of the earth's crust. G. R. MacCarthy has described certain "Experiments in Underthrusting" (*Am. Jour. of Sci.*, 5th series, vol. 16, pp. 51-67, 1928) from which he concludes that a fairly good case can be made for underthrusting rather than overthrusting in the Rocky Mountain Region, while for the Appalachian Mountain System the problem still remains indeterminate.

GEOPHYSICAL INSTRUMENTS

Application to Problems.—The necessity for discovering the geological conditions beneath areas in which surface exposures fail to give an accurate picture of conditions in depth has led to the increased application of geophysical instruments to the

problems of dynamic and structural geology. Among the modern "divining rods," the most important are the torsion balance, which reveals slight but important differences in specific gravity of the rocks immediately beneath the earth's surface; the seismograph which indicates varying reactions to the passage of vibrations caused by explosions; the magnetometer and other electrical devices which indicate variations in the conductivity of different rock masses.

Electrical prospecting has been especially successful when applied to the search for iron and copper ores (T. M. Broderick and C. D. Hohl: "Geophysical Methods Applied to Exploration and Geologic Mapping"; *Econ. Geol.*, vol. 23, pp. 489-514, 1928). L. B. Slichter, Frank Rieber, Karl Sundberg and others have contributed notably to the series of technical publications of the American Institute of Mining and Metallurgical Engineers, in which series a new "class" devoted entirely to geophysical prospecting was begun in July, 1928.

The torsion balance has been used especially in the mapping of geologic structures with the hope of discovering suitable conditions for the local reservoiring of petroleum. Among the many notable papers dealing with this subject is one by Donald C. Barton ("The Eötvös Torsion Balance Method of Mapping Geologic Structure"; *Am. Inst. Mining and Metallurgical Engineers, Tech. Publ.*, No. 50, Feb., 1928).

GEOLOGIC PROCESSES

Continental Drift and Isostasy.—These fundamental problems in the field of crustal deformation continue to hold a large place in current discussions of geological science. C. O. Swanson has formulated a working hypothesis of isostasy which will probably be acceptable to many geologists and geodesists (*Jour. Geol.*, vol. 36, pp. 411-434, 1928). Arthur Keith in his presidential address before the Geological Society of America (*Bull. G.S.A.*, vol. 39, pp. 321-386, 1928) refuses to accept the principal of extensive continental migration and upholds instead the theory of thrust against the continents from all of the surrounding oceans. He further upholds the doctrine that the shape and size of the several continents have been roughly constant from the dawn of recorded geologic history down to the present day. Papers presented in a symposium on the theory of continental drift have been published in book form by the American Association of Petroleum Geologists (Tulsa, 1928).

Rain and Mudflow.—The critical examination of the processes at work altering the face of the earth has resulted in several minor but notable advances in the understanding of the forces involved. Eliot Blackwelder ("Mudflow as a Geologic Agent in Semiarid Mountains"; *Bull. Geol. Soc. Am.*, vol. 39, pp. 465-484, 1928) calls attention to the fact that the occasional heavy rainstorms which occur in the mountains of semiarid regions may cause mudflows as well as floods. The mudflow acts like a lava stream and boulders weighing hundreds of tons may be carried on its surface many miles away from the mountain front. Certain interesting conglomerates in the Paleozoic formations of Quebec have been interpreted by Bailey, Collet and Field to be a result of ancient submarine landslips (*Jour. Geol.*, vol. 36, pp. 577-615, 1928).

BIBLIOGRAPHY

Technical Books. — Among the more notable book-size contributions to general geology published during the year are the following: "Geology of the Muddy Mountains, Nevada," by Chester R. Longwell, *U. S. Geol. Surv. Bull.* 798; *The Coral Reef Problem*, by William Morris Davis, Am. Geog. Soc., New York; "Studies of Basin-Range Structure," by G. K. Gilbert, *U. S. Geol. Surv. Prof. Paper* 153; "Geography, Geology, and Mineral Resources of Part of South-Eastern Idaho," by G. R. Mansfield, *U. S. Geol. Surv. Prof. Paper* 152; *Geology of the Virginia Triassic*, by J. K. Roberts; Charlottesville, Va., and "The Stratigraphy of the Pennsylvanian Sys-

tem in Nebraska," by G. E. Condra, *Nebraska Geol. Surv. Bull.* 1, 2nd series.

Non-technical Books.—The popular appeal of the science of geology is indicated by the publication of the following non-technical books: *The Earth and Its History*, by John H. Bradley, Jr., Boston; *Old Mother Earth*, by Kirtley F. Mather, Cambridge; *The Story of Geology*, by Allan L. Benson, New York, and *This Puzzling Planet*, by E. T. Brewster, New York.

EARTHQUAKES AND VOLCANOES

By Kirtley F. Mather

Professor, Harvard University

EARTHQUAKE DISASTERS

Western China.—General interest in earthquakes has been increased during the last year and a half by an unusually large number of major catastrophies in widely scattered parts of the globe. Fortunately none of these occurred in North America. The worst calamity was in Kansu, Western China, where many villages were laid waste by an unusually severe earthquake which resulted in the loss of upwards of 100,000 lives. Seismographs in all parts of the world reported this earthquake on May 23, 1927, but more than a month elapsed before the first word was received directly from the devastated area.

Other major disasters include the following:

Mineyama, Japan	March 7 1927	3274 killed and 6734 injured
The Balkans	February 14, 15 and May 15 1927	
Santiago, Chile	April 14 1927	
Jerusalem	July 11 1927	
Fergana, Turkestan	August 13 1927	
Vienna	October 8 1927	
Smyrna	March 31 1928	(the most severe quake in that region since Stamboul, 1894.)
Philoppopolis and vicinity in Bulgaria	April 14, 18 and 25 1928	
Corinth, Greece	April 22 1928	

On this continent the number of damaging earthquakes was slightly larger than usual, but the only loss of life occurred in Mexico.

EASTERN UNITED STATES

New York.—There were more damaging earthquakes in America than usual but the only loss of life was in Mexico. Ten earthquakes, all of relatively slight intensity, were felt in New England and New York during the interval that has elapsed since the last earthquake survey in The American Year Book for 1926. Potsdam and Ogdensburg were shaken at 9:12 A.M. on March 13, 1927; Quebec on the evening of July 24; Niagara Falls by two distinct shocks on the evening of November 12 which caused considerable excitement but did no damage; and Saranac Lake, N. Y., by two shocks between 10 and 10:30 A.M. on March 18, 1928.

Maine.—A very interesting series of slight earthquakes has been occurring in western Maine, particularly in the vicinity of Milo and Rumford. These earthquakes are at present being investigated by the United States Geological Survey. No damage has been caused by them, but several were sufficiently severe to startle or even alarm the local inhabitants. These occurred as follows:

4:30 p.m.	August 28 1926
	February 8 1928
12:29 a.m.	February 17 1928
8:30 a.m.	March 22 1928
During the night of	March 28, 20 1928
6:37 p.m.	April 25 1928

The last-named earthquake centered near Rumford and was of sufficient intensity to be recorded by the seismograph at Cambridge, Mass.

Southeastern Coast and Eastern Interior.—Several slight earthquakes occurred in this portion of the United States and among them some are of especial interest because they occurred in rather unusual regions not generally recognized as potentially seismic.

Poplar Bluff, Mo.	10:25 a.m.	October 27 1926
" " "	2:00 a.m.	February 3 1927
Mansfield, O.	between 11:30 and midnight	February 16 1927
Ridgely, Tenn.	4:30 and 6:30 a.m.	April 18 1927
Mississippi Valley between Memphis, Tenn., and Sikeston, Mo.	2:35 a.m.	May 7 1927 July 20 1927
The New Jersey coast between Toms River and Sandy Hook	8:23, 8:31 and 8:39 a.m.	July 1 1927
Richmond and Charlottesville, Va.	.....	June 10 1927
Elizabeth City, N. C.	.....	October 27 1927
Cape Girardeau, Mo.	9:05 a.m.	April 15 1928

WESTERN UNITED STATES

Interior.—An unusually large number of slight tremors was reported from the Western Interior during 1927-1928. No material damage was caused by any of these except in Helena, Mont., where on February 29, 1928, a fairly strong shock occurred at 3:38 p.m. The damage was very much less than that which occurred in this same general locality when it was vigorously shaken on June 27, 1925.

In addition to this earthquake at Helena the following also should be listed:

Pine and Eagle Valley Region	.....	April 8 and 9 1927
Arco, Ida.	.....	August 7-12 1927
Ord, Neb.	1:00 a.m.	October 14 1927
Billings, Mont.	10:25 p.m.	March 1 1928
Carson City, Nev.	7:30 p.m.	March 15 1928
Tonopah, Nev.	8:30 a.m.	March 26 1928
Reno, Nev.	2:39 a.m.	April 17 1928
Creede, Colo.	12:20, 2:20 and 5:15 a.m.	May 3 1928
Yuma, Ariz.	.....	July 19 1928
Helena, Mont.	.....	July 24 1928

Pacific Coast.—Property damage approximating $1,000,000 resulted from the most severe earthquake which occurred within the borders of the United States during the last two years when Calexico, Cal., and the adjacent Mexican city of Mexicali were rocked by a series of earthquakes which began at 12:18 a.m. on January 1, 1927. The shocks were felt in El Centro, Brawley and other towns in the Imperial Valley. They had been preceded by minor tremors which were noted at Calexico on September 18, 1926, at Brawley on November 24, and more generally throughout Southern California on December 8. Fortunately there were no casualties. Several after-shocks occurred during the following days and on January 6 another violent tremor was felt at 8:44 a.m. Many walls that had been weakened by the earlier earthquakes collapsed at that time. A long series of after-shocks continued throughout the entire year 1927. The most severe tremors were felt on February 12, February 23, July 15, October 5 and November 6.

Another quake which attained destructive intensity was centered near Eureka, Cal., and occurred at 12:06 p.m. August 20, 1927. It is believed to have originated under the sea on an extension of the San Andreas fault (Byerly, *Bull.* Seismological Soc. Am., December, 1927). It was preceded on May 16 and August 10 by tremors of only slight intensity in the same area.

The usual number of slight earthquakes were felt at scattered localities throughout the state of California. None of these caused any material damage but most of them were sufficiently violent to startle or alarm the local inhabitants. All told, a total of 53 shocks occurred in California during the two-year interval between October, 1926, and November, 1928. In addition to the tremors noted in the two preceding paragraphs, the following have been recorded:

Eureka, Weaverville and Lassen Peak	.....	October 13	1926
Anaheim	.....	November 4	
Los Angeles	.....	November 8	
Santa Ana	.....	November 10	
San Joaquin Valley	.....	December 27	
Redondo Beach	.....	December 29	
Los Angeles and vicinity	3:24 p.m.	January 29	1927
" " " "	2:00 p.m.	February 4	
" " " "	8:29 p.m.	February 6	
" " " "	12:33 a.m.	February 8	
San Francisco Bay region	3:54 p.m.	February 15	
Vicinity of Mount Lassen	7:00 a.m. and 2:00 p.m.	March 1	
Fort Bragg	1:05 a.m.	March 7	
Ventura	11:30 p.m.	April 4	
Los Angeles	.....	April 15	
Ventura	3:20 a.m.	May 15	
San Francisco Bay region	.....	May 28	
Los Angeles	4:26 and 5:08 a.m.	August 4	
Santa Barbara	4:40 a.m.	August 26	
Bishop, Bakersfield, Fresno and vicinity	6:00 p.m.	September 17	
Los Angeles	11:14 a.m.	October 8	
Santa Maria and Southern California	several shocks longest at 5:49 a.m.	November 4	
After shocks in the same locality	.....	November 18 and December 5	
Los Angeles	9:00 p.m.	December 10	
" "	8:34 p.m.	December 15	
Anaheim	.....	December 23	
Point Arguello and Santa Monica	.....	December 31	
Santa Monica	2:52 p.m.	January 7	1928
Brawley and the Imperial Valley	10:00 and 10:15 p.m.	January 13	
El Centro	9:30 p.m.	January 25	
Calexico	2:00 p.m.	February 15	
"	10:50 a.m.	February 21	
Bakersfield	7:00 p.m.	February 28	
Ventura	7:03 p.m.	March 10	
Santa Maria	4:03 a.m.	March 15	
" "	6:30 a.m.	March 16	
Brawley	3:50 a.m.	March 19	
Banning	8:45 p.m.	March 19	
San Bernardino	1:15 p.m.	March 20	
Santa Maria	10:23 p.m.	March 28	
Redondo Beach	4:40 a.m.	April 3	
Tehama	2:00 p.m.	April 15	
Lassen Peak, especially east of the mountain	just after midnight	April 16	
Los Angeles	11:22 a.m.	May 4	
Brawley	4:35 p.m.	May 21	
Trinity County	evening of	June 3	

ALASKA

An earthquake of more than moderate intensity was felt at Cordova at 8:30 p.m. November 14, 1926, and was followed by an after-shock on March 29, 1927. Neither quake caused any material damage. A still more severe earthquake was felt quite generally throughout Alaska at 6:59 a.m., October 24, 1927. Its center was in latitude 59° N., longitude 139° W. Fortunately that is a very sparcely populated locality so that little damage resulted from an earthquake which would have been a real disaster had the area of maximum intensity been occupied by towns or cities. After-shocks were felt in Juneau at 9:04 a. m. the following day and at 6:15 a.m. November 21 and 10:02 a.m. December 31. Two other earthquakes of sufficient intensity to

be recorded on seismographs throughout the world had their centers of origin in latitude 56° N., longitude 159° W., another sparcely populated region. These tremors occurred at 5:17 a.m. July 28 and at 1:13 p.m. August 6, 1927.

Other Alaskan earthquakes were as follows:

Kodiak ...	8:50 a.m.	April 17	1927
" ...	5:17 a.m.	July 28	
Seward ...	.....	December 9	
" ...	4:35 p.m.	January 24	1928
" ...	10:48 a.m.	February 20	
" ...	5:15 a.m.	April 6	
" ...	4:09 a.m.	April 10	
" ...	9:00 a.m.	June 20	
" ...	3:30, 8:30 and 9:20 a.m.	June 21	
Cordova ..	12:30 a.m.	June 8	

The three earthquakes noted above as having occurred at Seward on June 21 were sufficiently violent to rock the entire southern coast of Alaska but fortunately no appreciable damage was occasioned thereby.

CENTRAL AMERICA

The Panama Canal Zone was shaken by two quakes in 1927, both reported from Balboa. The first consisted of repeated shocks from 9:00 p.m. August 9th to 5:00 a.m. August 10th. The center was estimated to be 250 miles southwest of Balboa in the Pacific Ocean. The second frightened the inhabitants of Balboa and Panama City but did no material damage at 4:00 p.m. December 10.

Mexico.—The most intense earthquake registered there for years shook practically all of the central states of Mexico at 10:38 on the evening of February 9, 1928. Severe damage was done to buildings particularly in Atlixco, in the state of Puebla. It was preceded by a severe shock felt over a wide area in the state of Oaxaca on January 26, and followed by after-shocks on March 1, 21, 26 and April 16. A disastrous tremor shook Oaxaca on June 12 and 90% of the buildings in the capital of that state were destroyed or damaged. Another severe quake at 9:19 p.m. on June 16 increased the damage and four lives were reported lost. Tremors regarded as after-shocks of this quake were felt on June 17, 18, 19, 21, July 7 and 14. Mexico City was also shaken on August 4 and 13, and October 9.

SEISMOGRAPH STATIONS

Canada.—In response to the increased interest in earthquakes, both from the purely scientific and from the humanistic point of view, which has developed in this country during the last four years, several new seismograph stations have been established and the equipment at many of the old stations has been greatly improved by the acquisition of new apparatus. The Dominion Observatory at Ottawa has established two branch stations in Quebec, one at Shawinigan Falls and the other at Seven Falls, near Beaupré. The seismograph formerly in operation at McGill University in Montreal has been transferred to the latter, and Wood-Anderson torsion seismometors are also in operation in both of these stations.

United States.—The University of Virginia has equipped a seismograph station at Charlottesville, and the efficiency of the station supported by St. Louis University has been greatly increased by the establishment of a completely equipped observatory at Florissant, just far enough outside of the city of St. Louis to be free from traffic jars and other distractions incident upon city life. St. Xavier College has installed new instruments at its station at Cincinnati, and Harvard University has recently replaced its old Bosch-Omori seismograph with new Milne-Shaw instruments.

A net-work of stations equipped with Wood-Anderson machines and intended for the study of local earthquakes has been established in the vicinity of Pasadena, Cal., and a similar series of observatories now is centered around Berkeley, Cal. New instruments have been ordered by the United States Coast and Geodetic Survey for its station at Sitka, Alaska.

With these greatly improved facili-

ties for observation it is expected that the seismologists of this country will be able ere long to "feel the pulse of the earth" so accurately that they will be able to recognize the premonitory warnings which usually precede any disastrous earthquake.

VOLCANOES

The only American volcanoes reported to have been in eruption during the interval covered by this report are Bogoslof in the Aleutian Islands and Mt. Mageik, a volcano in the vicinity of Mt. Katmai, which has been emitting considerable quantities of gas since the eruption of Katmai in 1912. These indications of renewed activity in the chain of Alaskan volcanoes emphasize the need for the establishment of a fully equipped scientific observatory in that region. Dr. T. A. Jaggar, Chief of the Section of Volcanology of the United States Geological Survey, spent the summer of 1928 in his third expedition to Western Alaska and has recommended the establishment of such a station at Dutch Harbor.

ECONOMIC GEOLOGY

By W. Elmer Ekblaw

Assistant Editor, *Economic Geography*, Clark University

ORE DEPOSITION

Interest in economic geology has continued keen throughout the year. Though petroleum geology probably still holds the center of the stage, the general geologist, and particularly the student of ore deposition and deposits, has resumed a prominent rôle in geologic activities, and bids fair this next year to occupy a larger share in the public's interest than ever before.

Study of Processes.—A committee of ten members has been appointed by the Division of Geology and Geography of the National Research Council to consider the processes of ore deposition and this committee has been actively at work during 1928. In its first survey of the field, this committee discovered a deplorable dearth of pure research in the field, due to the pressure of economic and industrial demands for immediate, practical research, and the consequent enlistment of the services of the whole force of capable geologists in largely commercial enterprises. The funds available for pure research in ore deposition are woefully inadequate. The chairman of the committee, Dr. Waldeman Lindgren, has summarized the progress already made and outlined the program for future research in a report published in *Economic Geology* (Vol. XXIII, No. 6, pp. 591-611, September, 1928).

Noteworthy Articles.—A review of the articles published in *Economic Geology* and *The Journal of Geology* comprise a large number of articles on ore deposition, indicating a renewed interest in the subject. The following articles in *Economic Geology* for 1928 are all directly or indirectly concerned with this important phase of geologic science: "The Guanajuato Mining District, Mexico," Alfred Wandke and Juan Martinez; "A Genetic Comparison of Michigan and Bolivian Copper Deposits," J. T. Singewald, Jr.; "Review of the Radioactive Minerals of Madagascar," H. W. Turner; "Occurrence and Age of Brown Iron Ores in Alabama and Adjacent States," Geo. I. Adams; "Observations on Wood Tin Nodules," W. H. Newhouse and M. J. Buerger, "Mineral Association at the George Gold-Copper Mine, Stewart, B. C.," W. V. Smitheringale; "The Ores of Potosi, Bolivia," W. Lindgren and J. G. Creveling; "Silver Mineralization at Beaverdel, B. C.," H. E. McKinstry; "Technique in the Investigation of Iron Ores," Freleigh F. Osborne; "Diffusion in Ore Genesis," Alfred R. Whitman; "The Copper Prospect at Barrio Pasto, Porto Rico," R. J. Colony and H. A. Meyerhoff; "Origin of Nickel Silicates at Webster, North Carolina," C. S. Ross, E. V. Shannon, F. A. Gonyer; "Geologic Structure of

the Cuyuna Iron District, Minnesota," Carl Zapffe; "Time Sequence of Hypogene Ore Mineral Deposition," W. H. Newhouse; "New Occurrences of Germanium: I.," Jacob Papish.

In *The Journal of Geology* the following articles reveal the same interest: "Genesis of the Silver Hill Tin Deposits," Alfred L. Anderson; "Melikaria: Vein Complexes Resembling Septaria Veins in Form," Frederick A. Burt; "Production of Trachyte and Phonolite from Pyroxene Andesitic Magma Associated with Limestone," H. A. Brouwer; "Syngenetic Pyritization in Local Reducing Areas of Pennsylvanian Shales in Missouri," W. A. Tarr; "Syngenetic Origin of Pyrite Concretions in the Pennsylvanian Shales of North-Central Missouri," Henry Edwin Mathias; "On the Origin of the Alkaline Rocks," Joseph L. Gillson; "Adirondack Studies: The Age of Certain of the Adirondack Gabbros, and the Origin of the Reaction Rims and Peculiar Border Phases Found in Them," Joseph L. Gillson, Wm. H. Callahan, and Wm. B. Millar.

PUBLICATIONS AND RESEARCH

Waldemar Lindgren.—A number of books dealing with economic geology have appeared in 1928. A third edition of Waldemar Lindgren's classic work *Mineral Deposits* has been issued, carefully revised. Two new chapters have been added to this revised edition: Chapter III., which deals with "Atmosphere, Hydrosphere, and Underground Water," and Chapter X., which treats of "The Magma in its Relation to Mineral Deposits."

Koehne on Hydrography.—A comprehensive work in hydrography is *Grundwasserkunde* by W. Koehne, in which the author takes up the following phases of the subject: (1) definitions; (2) the passage of water into the ground; (3) the saturated zone; (4) the relation between groundwater reservoirs and geology; (5) important hydraulic formulæ; (6) the effects of canals, mines, etc., upon the flow of the groundwater; (7) measuring and estimating the quantity of groundwater; (8) the systematic observation of groundwater movements; and (9) relation between groundwater and husbandry.

Federal and State Research.—The United States Geological Survey and the Bureau of Mines have continued their programs of research and survey, beginning new studies and explorations as fast as others are completed. Both these government agencies could extend their valuable work much farther if only more funds were available. The routine and commercial or economic applied work that both must do restricts their efforts to a minimum of pure research; yet their personnel continually keeps up the struggle for productive research. The State Surveys and University Departments, likewise constantly handicapped by lack of funds, also continue their researches as limited time, funds, and personnel permit. Through these agencies, the work of economic geology goes on despite difficulties, and noteworthy achievements constantly reward the workers.

METALLIC MINERALS

Increased Use of Metals.—The use of metallic minerals constantly increases though not at the rate of fifteen or twenty years ago. With the more intensive industrialization of many of the countries of the world comes the need for more and more minerals, and the amount of metals used is almost incredible. Iron and steel, copper, lead, and zinc are basic factors in all industries; tin, nickel, silver, and gold; the alloy metals, manganese, vanadium, chromium, and many others; all these are being mined and manufactured to an extent almost altogether undreamed of a hundred years ago.

Iron and Steel.—The iron and steel industry of Great Britain has been consolidated by mergers involving the largest producing and manufacturing companies in England and Scotland. Three major organizations thus dominate this greatest of the world's metal industries: the United States Steel Trust, the Cartel of Continental Europe, and the British Association of Steel Industries. The competition among these three for the markets of

the world is assuming political importance of the first magnitude.

NON-METALLIC MINERALS

Coal.—The coal industry of the United States has not yet been stabilized. The submarginal mines are closed, and the more efficient collieries are operating at reduced profits. The need for reorganization in the industry is self-evident. The coal industry of Great Britain is even more demoralized though the situation there seems to be slowly improving. On the Continent, the status of the industry is materially improved. The expanding utilization of the low-grade brown coals of Germany characterizes the post-bellum period.

Mineral fertilizers are being used in constantly increasing quantities. After a period of serious depression, the Chilean nitrate production has begun to revive and to meet successfully the competition from manufactured nitrates. Production of potash in the United States has not yet begun on a commercial scale and the German product still dominates the market. North African phosphates compete more keenly each year with the Floridan deposits, though the latter still maintain a lead in the field.

Petroleum.—The petroleum industry does not face such serious overproduction as in 1927. Almost all of 1928 until mid-October, when decreasing reserves opened up much activity and encouraged renewed production, was distinguished by decreased yield. The daily average production for months at a time was 100,000 barrels less than for the corresponding periods in 1927, and on Aug. 1, 1928, a year after the peak of production in 1927, the daily average approached a diminution of 200,000 barrels. The daily average production toward the close of 1928 was near 2,500,000 barrels. The significant feature of the year in the petroleum industry was the increase of production in West Texas, where the daily yield rose to more than 300,000 barrels.

A notable address on the need for international coöperation in regulating the petroleum industry was delivered by Sir John Cadman, K.C. M.G., D.Sc., Chairman of the Anglo-Persian Oil Company, at the annual dinner of the American Petroleum Institute, December 6, 1928, in Chicago, and published in *The Oil and Gas Journal*, Dec. 13, 1928, pp. 85, 86, and 95. A brief quotation from that speech is noteworthy: "Now that oil as a bulwark of civilization is everywhere recognized, it is understandable and natural that the discovery of petroleum deposits within any country should stir the imagination of that country's citizens; and to some extent should preoccupy their minds with the thought of the rights and advantages which such geographical custody ought to bring. Moreover, the coming of the oil era has been relatively so sudden that some disturbance of mental poise and muddling of economic thought are for a time, at any rate, to be excused, if not condoned. Or, shall I say they could well be pardoned in the years when the subject of oil as a comprehensive world influence, as distinct from oil technology, was very scantily dealt with in works of reference or in the pages of enlightened journalism?"

MINERALOGY AND PETROGRAPHY

By Herbert P. Whitlock

Curator of Mineralogy, American Museum of Natural History

PROGRESS IN MINERALOGY

Tendencies.—Reviewing the advance of mineralogy during 1928 in a general way and comparing the progress of this science with that ascribed to other sciences, the fact becomes evident that such progress in mineralogy is represented rather by tendencies than by any definite and startling discovery. With the growing knowledge concerning the atomic arrangement in natural substances has

come the beginning of a tendency toward making use of some of these natural substances in the industrial advances that have recently attended our progress in the knowledge of physical forces. It would seem that here, rather than along the line of chemical adaptation, would come the utilization of the knowledge that research workers in this science are steadily adding to the sum of our general knowledge.

NEW MINERALS

Discoveries Increase. — Of late years, the number of new minerals which has been added each year to the long list of known natural compounds has been decidedly on the increase. An unusually large number of new species is to be credited to the year 1928. A number of chemical products, deposited by hot gases from burning pyrite as a result of an extensive fire in a mine at Jerome, Arizona, have been observed and named. These semi-artificial products have been here included among new minerals, because of the widespread and involuntary circumstances attendant on their mode of formation.

Guildite, a hydrous iron-copper sulphate, found in chestnut-brown monoclinic crystals, and named after Prof. F. N. Guild of the University of Arizona.

Butlerite, a hydrous ferric sulphate occurring in very small orange-yellow, orthorhombic crystals. It was named in honor of Prof. G. M. Butler of the University of Arizona.

Jeromite, a sulphide and selenide of arsenic, present as black fused globules, and named from the locality.

Lauderbackite, a hydrous ferrous and ferric sulphate, occurring as pale chestnut-brown crystalline crusts. It was named in honor of Prof. G. D. Lauderback of the University of California.

Rogersite, a hydrous ferric sulphate, differing slightly in composition from *butlerite,* and occurring in monoclinic fibrous aggregates. It was named in honor of Prof. A. F. Rogers of Stanford University.

Ransomite, a hydrous copper ferric sulphate, found in sky-blue orthorhombic crystals, and named in honor of Prof. F. L. Ransome of the California Institute of Technology.

Finds in Argentina.—A new silicate and titanate of manganese, yttrium aluminium and calcium was found in the Sierra de Cordoba, Argentina. It occurs in flesh red isometric crystals, and has been named *bodenbenderite* in honor of Prof. Wilhelm Bodenbender, of Argentina. From Argentina comes also a new copper selenide occurring in Sierra de Umango as metallic slate-blue granular masses. It has also been found in Harz, Germany, and its name, *klockmannite,* was given in honor of Prof. F. H. Klockmannite.

Other Finds.—Two new species have been discovered at Franklin, N. J., a locality long famous for its rare and unusual minerals. A lead and zinc silicate occurring as colorless orthorhombic prisms has been named *larsenite* after Prof. E. S. Larsen of Harvard University. *Calcium-larsenite,* a white massive mineral, has the same composition as *larsenite,* but with calcium replacing some of the lead. Two new, hydrated vanadates of calcium, *rossite,* and its partially dihydrated product *metarossite,* were discovered in Bull Pen Canyon, Colorado. They are named after Dr. C. S. Ross of the U. S. Geological Survey.

Ammoniojarosite, a member of the jarosite isomorphous group, with ammonium oxide replacing potash, was found in southern Utah, occurring as ochre-yellow nodules. *Collinsite* is a new hydrated potash of calcium magnesium and iron, occurring in concentric layers in phosphorite nodules from François Lake, British Columbia. It was named after Dr. W. H. Collins, Director of the Geological Survey of Canada. A new hydrated sodium and ferric sulphate, occurring as small greenish-yellow rhombohedral crystals on weathered shales from Bohemia, has been named *slavikite,* after Prof. F. Slavik of Prague.

A new hydrous manganese and aluminium silicate comes from Oberhalstein, Switzerland, a neighborhood that has furnished several related,

new species in recent years. The mineral, which has been named *sursassite*, from Sursass, an old dialect name for the locality, occurs in copper-red fibrous aggregates. *Thorotungstite* is a new hydrated oxide of tungsten and thorium, related to tungstite, and occurring in yellow masses of small crystals in Perak, Malay Peninsula.

METEOROLOGY

By Burton M. Varney

Professor, University of California at Los Angeles

AEROLOGY

Weather Service for Flying.—Expansion of aerological activities on behalf of aviation has gone forward at increased pace in the U. S. Weather Bureau. Dependence of commercial flying on weather reports from stations along the routes having been demonstrated; Federal funds applicable to increasing such facilities for aviation have been placed at the Bureau's disposal in gratifying amounts. The Weather Bureau and Department of Commerce have cooperated in broadening the service. The thoroughness of the work is suggested by the schedule of observing and reporting now in force at Hadley Airport, the New York terminal for major air routes from west and southwest. Situated in a belt of storminess during much of the year, such a port needs weather service which can interpret current atmospheric conditions in terms of their immediate effect upon flying weather. To this end, at least one out of a staff of four meteorologists is on duty every hour out of the twenty-four. Four pilot balloon "runs" each day supply data upon wind direction and velocity aloft. Weather maps, based upon telegraphed reports and drawn twice daily, feature the barometric changes during the two hours just preceding time of observation, an immense help to the meteorologist in forecasting currently developing weather. At other airports, e.g., those at Chicago, Kansas City, San Francisco, Los Angeles, similar schedules are carried out, though differing in detail to suit local requirements.

Guggenheim Aid to Meteorology.—The Daniel Guggenheim Fund for the Promotion of Aeronautics continued its vital connection with meteorology as applied to aviation. While it made during 1928 notable contributions of money directly or indirectly toward the development of aeronautics (some $300,000 being so applied), the Board of Trustees has announced that the Fund will "transfer its emphasis from assisting commercial aviation and stimulating public interest in its development to the consideration of the scientific problems involved in the mechanical structure of the airplane and the study of environmental conditions necessary for safe operation, particularly meteorology and the problem of fog flying." In cooperation with a committee headed by Admiral H. I. Cone representing the Guggenheim Fund, a sub-committee on meteorology of the National Advisory Committee for Aeronautics will, under the chairmanship of Professor Charles F. Marvin, Chief of the U. S. Weather Bureau, study the hitherto baffling problem of fog landing.

Of special interest is a grant of $34,000 by the Guggenheim Fund to Massachusetts Institute of Technology for establishing a three-year course in theoretical meteorology. The intention is to treat the subject according to physical and mathematical methods now indispensable to advancement in this extraordinarily difficult branch of science.

Post-Graduate Course for Naval Officers.—Meeting the pressing demand for the higher training of naval officers in aerology and meteorology for still further increasing efficiency in the flying service of the navy, a post-graduate course has been estab-

lished by the Navy Department. It includes two full years and two summer sessions: a year at Annapolis for review and extension of work in mathematics, physics, thermodynamics and technical German; a summer in Washington, D. C., for the study of weather maps and weather forecasting and for lectures on the physics of the air; a year at Cambridge, Mass., for advanced theoretical meteorology, physics and mathematics; a summer at Naval Air Stations for forecasting, aerological observations and study of changes in atmospheric structure day by day.

Of somewhat different nature, a course in meteorology offered, beginning February, 1928, by the Guggenheim School of Aeronautics, is intended to give fliers an opportunity to listen to and to hold discussions with those familiar with the influences of the air upon flight, upon airplane design, the operation of commercial air routes, etc.

Byrd Aerological Equipment.—To the Byrd Antarctic Expedition, aerological equipment was supplied by the U. S. Weather Bureau cooperating with the National Geographical Society. William C. Haines, who accompanied Commander Byrd to Spitzbergen in 1926, was detailed by the Bureau for the new venture. The plan is to establish a meteorological station either at the main base of the expedition at Bay of Whales or at one of the auxiliary bases. Besides the aerological program, which contemplates atmospheric soundings by airplane and balloon, forecasting based upon local observations correlated whenever possible with radio reports received from stations in the southern hemisphere, will be used in planning the exploration flights which will form one of the main activities of the expedition.

U. S. WEATHER BUREAU

Broadcasting Weather Reports.—The radio broadcasting of the U. S. weather reports in code exactly as received at the Washington Office of the Bureau was noted in this summary for 1927. The service has now been extended to a twice-daily broadcast at 8:15 a.m. and p.m. To it has been added also a pair of broadcasts (those in the International Numeral Code) at 11 a.m. and p.m. for the benefit of European weather services.

Radio Station at Pt. Barrow.—Establishment of radio communication from a Weather Bureau station over 450 miles further north than any other Alaskan station was an event with far-reaching possibilities. The station is Point Barrow, northernmost tip of the continent. From it a twice-daily weather report now comes to the Central Office. For tracing the movements of certain disturbances which have hitherto outwitted the forecaster because their progress or even their existence was unknown, these reports will be invaluable.

Wind Velocity Recording. — A striking improvement in wind velocity recording took effect at all first-order stations on January 1, when the new three-cup anemometer went into action, registering so close to true wind velocity at all speeds that tables for reduction of the higher speeds are no longer necessary as they were with the now obsolete four-cup instrument.

Collecting Weather Reports. — Great improvement has been achieved in methods of collecting the huge masses of weather reports. Prior to April 1, the "circuit system," by which District Forecast Centers received reports twice daily, worked much hardship by temporarily monopolizing certain telegraph lines. Now each weather station sends its reports over commercial wire either to Chicago or to New York, where a marvel of mechanical duplicating and transmitting machinery forwards selected reports to each forecast center, in somewhat less time than formerly and with minimum obstruction of commercial traffic. A somewhat similar revision of method in handling reports of the River and Flood Division of the Weather Bureau was also put into effect.

AMERICAN METEOROLOGICAL SOCIETY

The annual meeting (1927) held at Nashville, Tenn., Dec. 29-30, was

one of the most successful in the Society's history. Two outstanding features were a symposium on "Problems of the Mississippi River" and a session devoted to the history of the Tennessee Weather Service. "The prime importance of the rainfall in the middle and lower parts of the Mississippi Basin and the relative insignificance of all other factors was stressed and a plea made for a thorough-going meteorological investigation of great rain periods and their antecedents." Dr. W. J. Humphreys was elected president of the Society for 1928.

Spring Meeting (1928).—The Spring meeting of the Society in Washington, D. C., April 28, 1928, was made notable by two papers dealing with weather forecasting. Forest-fire warnings in Connecticut were discussed, as were recent developments in theodolites for taking atmospheric soundings on shipboard. An important paper suggested "Desirable Changes in the International Names and Symbols Employed in Recording Observations of Clouds." These suggestions were the subject of a supporting resolution by the Society.

Discussions at June Meeting.—In mid-June, 1928, a meeting of members in the western states was held at Pomona College in southern California. Among the papers were two on frost in relation to fruit-growing; one on a rigorous equation for the coefficient in the Dalton evaporation equation; one on causes of temperature inversions over the California littoral; two on relations between forest fires and weather in Oregon and Washington; and a paper urging the need for daily synoptic meteorological charts of the world on a uniform base permitting construction of a composite map for research purposes. (See *Bulletin of the American Meteorological Society* for fuller information on these and other papers.)

Endowment Fund.—A most significant event in the Society's history was its establishment of "The American Meteorological Society Endowment Fund, for the Encouragement of Meteorology" and the receipt of $2,000 to be applied to the fund from a friend of meteorology.

METEROLOGICAL EXPLORATIONS

Three expeditions of the highest significance to meteorology were under way from this country in 1928. The Byrd Antarctic Expedition will be in a position to make invaluable additions to our knowledge of the atmosphere in this little known region where the only weather records are the brief ones from previous expeditions. The three-year cruise of the nonmagnetic ship *Carnegie*, begun this year, will give an unparalleled opportunity for aerological work in regions of the seas where there has heretofore been little or none. The University of Michigan is continuing researches upon the meteorological effects of the inland ice in Greenland, directed by Professor Hobbs. Following the University's 1927 summer expedition, a winter party was established on Mt. Evans, just north of the Arctic Circle.

PROBLEMS AND RESEARCH

American Geophysical Union.—Problems discussed at the 8th annual meeting in April (Washington, D. C.) were principally those having to do with penetration of solar radiation into bodies of water, and those connected with the temperatures of surface waters.

Cyclones.—For understanding the mechanism of North American storms, no line of research is proving more profitable than aerology, applied particularly to finding what modifications, if any, of the Bjerknes structure of cyclones are to be recognized in such storms. A good beginning has been made in two ways. The initial studies dealt almost exclusively with selected sequences of meteorological events at the earth's surface and above it as effecting a wide expanse of country, analysis of interrelations of individual cyclones and anticyclones. A more recent study attacks the problem by analyzing a long series of data from a single station, arriving at averages and resultants of free-air conditions. The study was based on data from 3,333

single theodolite observations on the flight of pilot balloons covering a period of some eight years at Madison, Wis. It resulted "in strengthening the belief in the presence of the primary sliding surfaces in a large number of cyclones passing this region. Southerly air transport over shallow easterly currents in front of the cyclone center . . . is supported by cloud movement in the intermediate levels. This sliding surface apparently often extends to the limits of the centripetal currents of the cyclone on the northeast and frequently into the adjacent *HIGH* . . ."

Agricultural Meteorology.—Messrs. Kincer and Mattice of the U. S. Weather Bureau amplified a method of multiple correlations of weather data with crop yields (previously developed by Kincer) in such a manner as to segregate from the unwieldy a number of variants "those which in combination with certain others, contribute to the augmentation of the final multiple coefficient" and at the same time to discard those that do not so contribute. In the demonstration of the method, fifteen weather variants are used, and the correlation of these *separately* with corn crop yields ranged between —0.66 and +0.47. The new method, while avoiding the prohibitive labor of computing a multiple correlation from all these variants, produced a final coefficient of 0.89 and restricted the departure of computed yields from actual yields to 2 bushels or less (usually much less) in 20 out of 25 years, truly a gratifying result. No less important are Kincer's results with the multiple correlation method in computing on the basis of weather data the prospective reduction of cotton yield due to boll weevil. For the seven cotton states investigated, the straight correlation between computed yield and actual yield was in one state 0.90 and in six others ranged between 0.93 and 0.97.

Forest Meteorology.—Special attention has been paid to the moisture conditions of the air as affecting fire-hazard. G. W. Alexander has brought out a study of "The Frequency and Persistence of Low Relative Humidity in the State of Washington," discussing certain critical humidities, atmospheric pressures and conditions that cause them, reaching conclusions of great importance for forest conservation. P. W. Stickel has been analyzing forest-fire weather in central Massachusetts, deducing significant relations between atmospheric relative humidity and the moisture content of forest litter ("duff") as influencing fire hazard.

The ever fresh problem as to effect of forests on disposal of moisture that falls on them has been attacked from many angles. The most important study of this sort in this country is the joint investigation by the U. S. Weather Bureau and the U. S. Forest Service which, after years of careful measurement of factors involved, reached publication in 1928 as *Monthly Weather Review Supplement* No. 30; "Forest and Stream-Flow Experiment, Wagon Wheel Gap, Colorado," very fully abstracted in *M. W. R.*, March, 1928.

TERRESTRIAL MAGNETISM

By Daniel L. Hazard

United States Coast and Geodetic Survey

MAGNETIC SURVEYS

Carnegie Institution Cruise.—On May 1, 1928, the yacht *Carnegie* of the Department of Terrestrial Magnetism of the Carnegie Institution of Washington left Washington, D. C., for her seventh cruise, after being out of commission for over six years. The plans provide for a world-wide cruise covering a period of three years and a distance of over 100,000 nautical miles. As in the past, observations of terrestrial magnetism and electricity have been given first place in the program, but provision has been made for a large amount of oceano-

graphic work, biological as well as physical, for meteorological observations and for various radio investigations. The yacht has been equipped with a sonic depth finder, apparatus for deep sea sounding by wire and for taking water samples and temperatures at various depths. The first part of the cruise was in the North Atlantic as indicated by successive stops at Plymouth, England; Hamburg, Germany; Reykjavik, Iceland; and Barbados, West Indies. In October the *Carnegie* passed through the Panama Canal to continue her work in the Pacific.

Expeditions by Land.—With the resumption of magnetic work at sea, the Department of Terrestrial Magnetism has been obliged to curtail its magnetic surveys on land. The occupation of repeat stations in Central Africa was completed and arrangements were made, in coöperation with the University of Cape Town, to extend the work to South Africa. An expedition has gone into Central Asia which is expected to secure magnetic observations at repeat stations in Syria, Persia, Turkestan, and Northern India,—a region where existing knowledge of the secular change of the earth's magnetism is very limited.

Repeat Observations.—The United States Coast and Geodetic Survey has continued its program of reoccupying selected stations at intervals of about five years, for the determination of the change of the earth's magnetism with lapse of time. The work of the past year has been mainly in the states between the Allegheny Mountains and the Mississippi River. Repeat observations were also made at a number of stations along the Yukon River in Alaska, and new stations were established on some of its tributaries and on the Richardson Highway between Fairbanks and Cordova in regions where observations had not been made before.

Declination observations were made at many triangulation stations in Alaska and the Philippine Islands; and a number of stations were established on French Frigate Shoal and Neckar Island of the Hawaiian group. Magnetic instruments were loaned to the Stoll-McCracken Expedition to Western Alaska and Eastern Siberia. The United States Navy made magnetic observations in Cuba and Panama in connection with its hydrographic surveys.

The surveyors of the Topographic Survey of Canada made declination observations at more than 1,000 stations, some of them repeat stations, established many meridian lines and made a few determinations of dip and intensity. Attention was particularly directed towards obtaining declination observations in the newer parts of the country and near navigable waters. Several expeditions to the far north, dispatched by various authorities, were fitted out with instruments for determining the magnetic declination.

MAGNETIC OBSERVATORIES

Continuous photographic records of the variations of the earth's magnetism have been made at observatories maintained by the United States Coast and Geodetic Survey at San Juan, P. R.; Cheltenham, Md.; Tucson, Ariz.; Sitka, Alaska; and Honolulu, Hawaii; by Canada at Agincourt, near Toronto, and at Meanook, Alberta; by Mexico at Teoloyucan, near Mexico City; by the Department of Terrestrial Magnetism of the Carnegie Institution of Washington, at Watheroo, West Australia, and at Huancayo, Peru. That Department also coöperated with New Zealand in the maintenance of the magnetic observatory at Apia, Samoa. The continued operations of these observatories is of very great importance to the study of the magnetism of the earth as a whole, because of their wide distribution in latitude and longitude.

INVESTIGATIONS

Magnetic Methods.—During the year there has been a marked increase in the use of magnetic methods in the investigation of underground geological formations, particularly in connection with the search for oil. The method commends itself because of the rapidity and low cost of a

magnetic survey, but the correct interpretation of the results is a difficult matter, even when supplemented by other geophysical methods. The annual meeting of the Section of Terrestrial Magnetism and Electricity of the American Geophysical Union was devoted to a symposium on "Geophysical Methods as applied in the Study of Geological Structure," in which the Sections of Seismology and Geodesy joined. This subject was also the principal feature of the annual meeting of the American Institute of Mining and Metallurgical Engineers, and has been discussed at a number of other scientific and technical meetings in this country as well as abroad.

Radio Transmission.—The present intensive study of the peculiarities of radio transmission, particularly of the short wave lengths, promises to throw much light on the relation of solar activity to magnetic storms, auroras, earth currents, and other allied terrestrial phenomena. Just as the seismograph tells much about the interior of the earth, so the radio is supplying important information regarding conditions in the upper atmosphere. On the basis of a modified conception of the ionization of the upper atmosphere, the theory has been advanced that ultra-violet light from the sun may be the cause of magnetic storms and auroras on the earth.

Deflection Observations.—The Department of Terrestrial Magnetism is devoting much study to the secular change of the earth's magnetism in order to be able to reduce to a common epoch its observations in all parts of the world covering a period of 20 years. The Coast and Geodetic Survey has been investigating the interaction of two magnets when one is deflected by the other, and the relation of distribution coefficients to the pole distances of the two magnets, in order to find the best method of taking account of these factors in deflection observations.

INSTRUMENTS

Measuring Vertical Intensity.—An instrument for measuring directly the vertical intensity, in use at the new observatory at Godhavn, Greenland, consists essentially of a pair of Helmholtz coils set up with axis vertical. A current is passed through them of such strength as to compensate the vertical component of the earth's field. The dimensions of the coils and the current through them give the value of the vertical intensity. Reports have been received of the successful operation of a new vertical intensity variometer at the magnetic observatory of Rude Skov, Copenhagen. Its outstanding feature is the very light magnet system, weighing only about five grams, thus making it possible to have the points of the pivots very fine.

Vibration of Oscillating Magnet.—The United States Coast and Geodetic Survey and the Department of Terrestrial Magnetism have jointly developed a method of recording automatically on a chronograph the time of vibration of an oscillating magnet, with the aid of a photo-electric cell.

NECROLOGY

Professor E. Wiechert, Director of the Geophysical Institute and Professor at the University of Gottingen, died on March 19, 1928, aged 67 years.

Dr. Charles Chree, F. R. S., from 1893 to 1925 Superintendent of the Kew Observatory, died on August 12, 1928, aged 68 years. He was the author of numerous publications on Terrestrial Magnetism, atmospheric electricity and allied subjects. He was president of the Section of Terrestrial Magnetism and Electricity of the International Geodetic and Geophysical Union from its organization in 1919 to 1927.

ECONOMIC GEOGRAPHY

By W. Elmer Ekblaw

Assistant Editor, *Economic Geography*, Clark University

STUDIES AND SURVEYS

Application to Business.—The year has been rich in activity in economic geography. The American public, particularly business men and executives, is awakening to the great need of more extensive studies in the physical conditions which underlie most of men's activities. The maps and reports of the geologic surveys, particularly the topographic surveys of the weather bureau, of the bureaus of soils, and of the many biologic bureaus, and other agencies are being generally applied to business enterprises of all kinds, and many special surveys are being planned or carried out in almost every phase of industry. In all of these studies and surveys, the need of the trained economic geographer is recognized, and though as yet the number of these experts is all too small, they are rendering valiant service.

Michigan and Wisconsin.—Michigan has operated a land economics inventory survey for several years, on a scale not yet projected elsewhere. This detailed survey of the northern counties of the state was necessitated by the economic menace of the waste land of that section, in their inability to support any program of taxation that would adequately sustain the minimum of social and cultural requirements of the scattered population of the state. The survey inventories all the resources of the section including relief, drainage, soils, vegetation cover, game, agricultural, industrial, recreational and other possibilities, and intent of use of the land by the present owners. At a cost per acre so low as to be negligible, data of the utmost importance and value are being exhaustively collected. Wisconsin is inaugurating a similar survey.

New England.—The Rural Life Survey of Vermont is another survey of somewhat the same character, though more general and inclusive, and not so detailed. The program of this survey extends over a number of years and includes studies of social and economic conditions as well as the physical bases for them. Along the same line, but not so directly, the New England Council is inaugurating a series of surveys of agriculture and other industries throughout New England.

Kentucky and Tennessee.—The State Geological Survey of Kentucky has completed a series of regional surveys of that state, and the results have been published in six excellent reports. In Kentucky, these surveys are being continued into special fields and special industries. Tennessee has initiated a similar study.

AGRICULTURE

The economic situation among the farmers of the country has been much improved the past year, though permanent recovery from the post-war depression is not yet assured. Remedial measures are being formulated by which it is hoped that the agricultural problem may be solved. The present trend is toward the commercialization of the industry, or large scale farming. This tendency is shown in the decrease of the number of farmers, the acreage of the land devoted to crops, and the number of small land holders. Submarginal croplands are reverting to pasture or woodland, while the productive lands are being more scientifically and effectively utilized. The land under cultivation is being restricted rather than expanded, but even so the total yield of farm products is increasing due to better methods and higher efficiency.

Trend to Scientific Methods.—With an ever-growing interest in the wise utilization and reasonable conservation of all resources, the American people are turning slowly but surely to sound scientific method, away from the haphazard misnamed

"practical" policy of the past. In agriculture, trade, manufacturing, medicine and health, education, in fact in every phase of human activity, the "scientific method" is being adopted, not always discreetly, not always with intelligent direction, but generally with success.

Soil Research.—In no field of research has greater progress been made than in the study of soils. The Bureau of Soils in the United States Department of Agriculture has led the way in America, and is now forging to the very forefront in the research carried on in all parts of the world; but for many years the Europeans, led by such men as Ramann, Glinka, Frosterus, and Murgoci, have been the pioneers. Perhaps in no country has such an extensive program of soil study been carried out as in Russia, while the United States has mapped intensively probably the largest area.

Soil Science.—The development of soil science in America has been dominated until recent years by the controversy between the school of which Cyril G. Hopkins of the University of Illinois was the chief protagonist and to which the chemical composition of the soil was significant, and the school led by Milton Whitney of the United States Bureau of Soils to which the physical and textual characteristics of the soil were most important. Happily, their opposing views have been reconciled in the recent developments of the science, so that progress goes on apace.

MANUFACTURES

Textiles.—Manufacturing, like agriculture, has suffered a period of serious depression in some of its phases, though not to the same extent. The metal industries have not been seriously affected, and the building trades have done fairly well, but the textiles have suffered most severely. The rapid development of artificial silk or rayon; the extension of cotton growing into new regions, particularly the British colonial possessions, to compete with the American cotton belt, and the changes within the cotton belt itself consequent upon the widespread ravages of the boll weevil; the expansion of cotton mills in the American Piedmont; are some of the developments that are engaging the attention of the textile industry and the students who have been called into consultation. Forces which may or may not be directed or controlled are being set into motion, and to predict what their ultimate effect may be engrosses the time and serious thought of the whole industry.

In the United States, the readjustment of the industry, due to the spectacular character of the features distinguishing it, such as the rapidly increasing spindlage in the South, the abandonment of mill after mill in New England, the fight on the boll weevil and the attempt to generalize Cotton Belt agriculture, and the sensational rise of rayon to dominance in both manufacture and use, has attracted the attention of the whole country. The successful achievement of this readjustment without permanently unfavorable effect upon national prosperity and international relations is the goal of the government and the industry, and is the hope of our whole people.

Steel.—No country in the world is so lavishly endowed with resources as the United States; beneficent climate, favorable relief, fertile soil, adequate forests, grass land pastures, rich crop lands, and great reserves of petroleum, iron, coal, copper, and almost all the minerals requisite to a great industry. Probably no other country possesses such adequate supplies of the raw materials necessary to the development of a great industry and the occupation of a great population in industrial labor, and also such adequate sources of food for feeding that population, of fibers for clothing it, of building materials for sheltering it, and of fuel and illuminants for heating and lighting its homes.

This fortunate combination of resources has led to an iron and steel industry which has become the greatest in the world and which bids fair to attain a size and importance not yet even approached. The rapid rise of the industry, its dominance in the markets of the world, and its contribution to the progress of the world

and the comfort of the world's peoples constitute a romantic tale that has not yet been told, the majestic theme of this age about which the virile literature of our time has begun to center.

FISHERIES

It is not solely for food that the fisheries have been so significant. The vicissitudes of the fisherman's life have skilled him in navigation, stimulated his courage, accustomed him to sea- and sky-bound horizons without a glimpse of land in sight, and steeled him to the hazard and hardship of long, adventurous explorations. The fisheries have been the nurseries of navies—for Greece, for Rome, for France, for Japan, for Britain. Have not the fisheries of the Euxine, the Mediterranean, the Bay of Biscay, the Dogger Bank, and the Grand Banks affected the rise and fall of nations? The value of the fisheries remain as great as ever. Two brilliant articles have been published in *Economic Geography* from the pen of J. H. Mathews dealing with the Atlantic fisheries of the United States.

TRADE AND TRANSPORTATION

Foreign Trade.—Competition for the markets of the world has become exceedingly keen, and the United States is not disposed to relinquish its share without a struggle. The past year has been characterized by an expansion of the foreign trade of the United States, particularly with the Latin-American and trans-Pacific countries. It is reasonably to be expected that under the administration of President Hoover, the development of foreign trade will be consistently promoted, and that it will flourish as never before.

Canals.—Two exceedingly significant articles on transportation have appeared in *Economic Geography* the past year. The first, "New York Barge Canal—Expectations and Realizations," aroused considerable interest and discussion and was reprinted in a number of trade publications. The general conclusion drawn in this article is that "transportation conditions have changed since the middle of the nineteenth century when the Erie Canal was in its prime. Now the railroads are in a condition better than ever before. The latest reports show that more traffic is being carried on them and carried more efficiently than ever before in their history. The delays of trans-shipment, and of slow canal boat movement, and the limited navigation season, outweigh the benefits of a slightly lower rate. In other words, we have passed out of the canal and river period in transportation. Such waterways are obsolete in the United States."

Railways.—The second significant article is "The Civilizing Rails," by Mark Jefferson in the July, 1928, issue. In this illuminating article, widely quoted and copied, the author presents, by text and a brilliant series of maps, the part that railways have played in the progress of our modern civilization.

PUBLICATIONS

Periodicals.—*Economic Geography* continues as the premier publication restricted to the subject of economic geography in America, though many excellent articles appear elsewhere, notably in *The Geographical Review*. *The Commerce Yearbook* for 1928, issued by the United States Department of Commerce, is exceptionally valuable. The maps included within Volume II of this report are excellent.

South American Trade.—Probably the most exhaustive and authoritative work on the subject of Latin-American Trade is "The Commerce of South America," by Clarence F. Jones, which takes up the commerce of the whole continent as well as of each country, with all the nations engaging in South American trade. It is an invaluable book, both as a text and as a reference.

Papers on Steel.—"Iron and Steel Industry of the Pittsburgh District," and "Iron and Steel Industry of the Birmingham, Alabama, District," by Langdon White, and "Location Factors in the Iron and Steel Industry," by Richard Hartshorne, are three noteworthy contributions to the literature of steel, all published in *Economic Geography* the past year.

CARTOGRAPHY

By W. L. G. Joerg

Editor, *Research Series*, American Geographical Society

INTERNATIONAL MAP OF THE WORLD

The progress of this undertaking since last year's report (American Year Book, 1927, p. 610) is characterized both by the publication of unusually many sheets and by a number of important agreements reached at the meeting of the international commission held in connection with the twelfth International Geographical Congress in England, July, 1928. The new agreements (see *Geogr. Journ.*, Oct., 1928, pp. 363-365) relate; (1) to several changes and additions among the conventional signs (they affect mainly international boundaries and aviation symbols); (2) to the addition when necessary of a reliability diagram to each sheet indicating the quality of the various sources used—a feature adopted from the map discussed in the next section (see American Year Book, 1925, p. 878); and (3) to the publication henceforth in the annual report of two index maps, one for standard sheets from whatever source derived, whether official or not, and the other for sheets that do not conform to the standard requirements. Among the 28 new sheets the most interesting are North M-13 (Regina) and South I-56 and J-56 (Sydney, Bodalla) because they are respectively the first sheets published of areas in Canada and Australia, both countries lacking, like our own, adequate general maps (see American Year Book, 1927, p. 610). The other new sheets are: in Europe, P-27 and 28 (Hekla), P-34 (Turku-Åbo), P-35 (Helsinki), O-29 (Hebrides), O-30 (Aberdeen; formerly The Highlands), both the last being new editions—O-33 (Norrköping), N-34 (Ostpreussen; German version of same sheet as Polish Warszawa), M-33 (Praha; Czechoslovak version of Austrian sheet Wien); in Africa, J-31 (Alger); in Asia, G-42 (Sind), G-41 (Makrān), South B-48 (Batavia), B-49 (Soerabaja), B-50 (Makasser), and 11 sheets mainly south of 20° N. and between 96° and 114° E. covering Siam and French Indo-China by the respective topographical surveys of those two countries.

MAP OF LATIN AMERICA IN 1:1,000,000

Of this monumental work of more than continental scope being published by the American Geographical Society of New York sixteen sheets have appeared since the first eight sheets referred to in the previous report (American Year Book, 1925, p. 878), *viz.*, North F-16 (Yucatan), E-19 (Santo Domingo-San Juan), E-20 (Lesser Antilles, North), D-20 (Lesser Antilles, South), C-17 (Panama), B-22 (Cayenne), A-22 (Amapá), South A-19 (Putumayo-Içá), B-19 (Rio Juruá), E-20 (Sucre), F-20 (Rio Pilcomayo), H-19 (Coquimbo-San Juan), I-18 (Cauquenes e Islas Esporádicas), L-18 (Peninsula de Taitao), M-18 (Isla Wellington-Lago Argentino). The central axial block of sheets now practically covers the whole of the Andean system from Cuzco to Cape Horn with adjoining parts of the Amazon Basin and the eastern Piedmont belt in a wealth of detail and in a degree of accuracy never hitherto attained. The other scattering sheets so far published give an insight no less complete into the West Indian world, the Isthmus of Panama, and a corner of the Guianas.

RELIEF MAPS OF STATES

Based on the 1:500,000 maps of the U. S. Geological Survey (American Year Book, 1925, p. 879) of the respective states three relief maps have appeared, each illustrating a different manner of representing topography. On the map of Virginia by the Virginia Geological Survey contours are used (interval, 500 feet); the map of Tennessee by the U. S. Geo-

logical Survey shows relief very effectively in shading (by R. W. Berry); and the unpublished map of New York drawn by C. H. Hewitt under the direction of O. D. von Engeln of Cornell University represents the terrain by hachuring in pen and ink.

METEOROLOGICAL MAPS

Pilot Charts of the Upper Air.—The rapid development of aviation is further reflected cartographically (for previous aviation maps see AMERICAN YEAR BOOK, 1925, p. 879; 1927, pp. 610-611) by the fact that the Hydrographic Office, from its own data and those of the Weather Bureau, has begun (Dec., 1927) the publication of a series of monthly Pilot Charts of the Upper Air for the North Atlantic Ocean. Wind roses in four different colors show the winds prevailing respectively at the surface, at 2500 feet, at 5000 feet, and at 10,000 feet within each five-degree "square" of latitude and longitude. Recommended transatlantic seaplane routes are also shown.

Actual Temperatures of North America.—Another set of maps that present fundamental meteorological data in a new way are the two maps of North America, 1:9,000,000, edited by J. F. Unstead and E. G. R. Taylor in Philip's Series of Comparative Wall Atlases (Geo. Philip, London, 1927), showing actual temperatures, one for January, the other for July. Instead of showing average temperature in the usual way, reduced to sea-level, these maps show the average temperature that actually obtains at any given point of the land surface, whatever its elevation. The former is the method of the physicist and its figures are theoretical in nature; the latter is the method of the geographer and its figures have direct bearing on life, reflecting, as they do, the climatic conditions under which man actually lives. The present maps show temperature belts each covering a range of 4° F., the January map from —36° to 80°, the July map from 12° to 92°. The belts are shown in different colors ranging from blues through yellows and pinks to purple, the same color being used to represent the same belt on both maps. The march of the seasons is thus strikingly illustrated when the two maps are viewed side by side. The much greater approximation to the truth of the actual-temperature method is illustrated by the detailed nature of the temperature belt pattern as compared with the smooth generalized curves of the usual isotherms, or lines joining places having the same average temperature reduced to sea-level.

MISCELLANEOUS

Canadian Map Publications.—Among Canadian map publications may be mentioned an excellent three-sheet map of Alberta, 1:792,000, showing relief in contours (interval, 200 feet) published by the Topographical Survey, Ottawa, 1923-28, and *An Historical Atlas of Canada* by L. J. Burpee (Toronto, 1927) containing maps showing explorers' routes, territorial and economic development (including three valuable maps showing the origin of the early settlements in the Maritime Provinces and Upper and Lower Canada), distribution and racial origin of population, and boundary disputes.

Polar Maps.—The renewed interest in polar exploration is given a firm scientific footing in two maps published by the American Geographical Society: a revised edition of Nansen's fundamental bathymetric map of the Arctic Basin, 1:20,000,000 (*Spec. Publ. No.* 7, New York, 1928, Pl. I) and a Map of the Antarctic in four sheets on the unusually large scale of 1:4,000,000 which incorporates all known information.

New Work in Map Projections.—Welcome evidence of constructive work in map projections in our university departments of geography is afforded by a recent Univ. of California publication in Geography (Vol. 2, No. 6, Berkeley, 1927) entitled *The Cylindrical Equal-Area Projection for a New Map of Eurasia and Africa* by C. W. Thornthwaite, with map in 1:40,000,000.

AMERICAN EXPLORATIONS

By Robert M. Brown

Professor, Rhode Island College of Education

ARCTIC EXPLORATIONS BY AIR

The attention of the public has been centered this year as during the past two seasons on the explorations of air routes. Loss of life has been in excess of previous years, yet enough success has been recorded to inspire an increasing number of daring flyers to venture on untried and uncharted flights.

Wilkins Expedition.—Two expeditions entered the North Polar region during 1928; one under the leadership of Captain George H. Wilkins was spectacular and successful, the other under the direction of General Umberto Nobile ended in tragedy. Captain Wilkins in a Lockheed Vega standard plane with Carl B. Eielson left Point Barrow, Alaska, on April 15, and reached Green Harbor Spitsbergen (Svalbard) on April 21 in 20½ hours flying time after being storm-bound five days at the northwestern tip of Ice Fiord, a short distance from his destination. Wilkins' route was not over the Pole but from Point Barrow he set a course approximately northeasterly to the northern shores of Grant Land and Greenland, then southeasterly to Spitzbergen. The flight carried him over the site of the hypothetical Crocker Land of Peary, and no sign of land was noted but instead "leads of open water, ice generally rough and ridged but not heavily pressed as to suggest shallow-water conditions."

A remarkable feature of the flight was the skill in navigating the plane along the path which cut the meridians obliquely. The difficulties with compass declination and dip in the region so close to the magnetic pole greatly complicated the problem but Wilkins explains that on carefully working out the track, applying the corrections required for declination and the frequent change of longitude, the difficulties were surmounted. Wilkins states as his belief that both airplanes and dirigibles may be used with safety at certain times of the year even without preliminary ground preparation; and with adequate ground preparation, aircraft may be used to cross the Arctic at all seasons.

Nobile Expedition.—General Nobile with a crew of 16 men in the dirigible *Italia*, after a successful 2,000 mile voyage from King's Bay, Spitsbergen, to Lenin Land and return started for the North Pole on May 24. Reaching the Pole the same day and cruising about for two hours, the *Italia* was headed back to King's Bay. When within 225 miles of her destination the dirigible came down; struck the ice and had its cabin torn off, throwing Nobile and 8 others on the floe. The dirigible relieved of this load floated off with seven other members of the crew to be lost in the Arctic. Of the crew General Nobile and 6 others were rescued.

Relief Attempts.—Attempts at rescuing the stranded men added to the tragedy. A party of 6, including Roald Amundsen and Lief Dietrichsen, Norwegian polar explorers, left Tromsoe, Norway, on June 18 in a French seaplane to aid the *Italia* crew and disappeared. Captain Sora, Italian Alpine chasseur, set out with 10 Alpine chasseurs from the *Italia's* supply ship, the *Città di Milano*, to search for 3 of the missing *Italia* men who set out from the ice camp to try to make land and to bring aid. They found nothing. On July 27, Sora went out alone and did not return. The total cost in lives was 17.

The International Society for the Exploration of the Polar Regions which plans extensive polar flights next year in the LZ-127, a gigantic Zeppelin being built at Friedrichshafen, believes that the *Italia* was too small a type of ship for an Arctic voyage. It was explained that there had been a great reduction in the necessary reserves of ballast which

was dangerous if ice formed on the ship, and a limiting of polar equipment requisite for a possible forced landing. The Secretary of the Society, Dr. Bruns, in speaking of the proposed flight states that in order to be independent of the especially unfavorable storm conditions of Spitzbergen, one should before all else establish his base for Arctic exploration as far distant as possible from the Arctic. The Society plans anchorages in Leningrad, possibly at Murmansk in Kola, and at Nome, Alaska.

OTHER ARCTIC EXPLORATIONS

The Rawson-MacMillan Subarctic Expedition which left the United States in June, 1927, returned in September, 1928. This, MacMillan's eleventh trip into the North, was of a tamer nature than most of his ventures, the time being devoted to collecting specimens and seeking evidences of early explorations. His researches into early Norse voyages was negative.

Hobbs' Greenland Station.—For the third year the University of Michigan Greenland Expedition under Dr. William H. Hobbs maintained their meteorological station on the Greenland ice cap. The researches of Hobbs and his party are based largely on the question of the polarity of the weather. An extensive elevated area such as the Greenland glacier may be a breeding ground of cold air which by gravity will move down the slope and be extensively effective. Greenland may be the dominant weather pole of the North.

TRANSATLANTIC FLIGHTS

Hinchcliffe-MacKay.—On March 13, 1928, Captain Walter Hinchcliffe with the Hon. Elsie MacKay as passenger left the Cranwell airdrome, England, in the Stinson monoplane, *Endeavor*. Five hours later the plane passed southwestern Ireland and disappeared.

Bremen Flight.—One month later, on April 13, the Bremen flying from Dublin with the Germans, Captain Herman Koehl and Baron Gunther von Huenefeld, and Commander James Fitzmaurice of the Irish Free State Air Forces was forced down after a 38-hour flight at Greenly Island, Strait of Belle Isle, Labrador. From this isolated position they were rescued.

Stultz-Earhart.—Miss Amelia Earhart, with Wilmer Stultz as pilot and Louis Gordan as mechanic in a trimotor Fokker monoplane, the *Friendship*, left Trepassey, Newfoundland, on June 17th and landed in Burry Estuary, Wales, on June 18th. The crossing was made in 20 hours and 49 minutes.

Polish Flight.—On August 5, Majors Idzikowski and Kubula, Polish flyers, from Le Bourget, France, to New York in the sesquiplane *The Marshal Pilsudski* were rescued from the sea by the German steamer *Santos* about 60 miles off Cape Finisterre. During the same week Captain Frank T. Courtland with three companions, *en route* from the Azores to Newfoundland, were rescued from the sea when their plane caught fire and forced a descent.

Hassell-Cramer.—On August 11, Bert Hassell and Parker Cramer, attempting an America-to-Sweden flight in the *Greater Rockford*, left Cochrane, Ont., and made a forced landing at Point Sukkertoppen in Southern Greenland. After subsisting two weeks on pemmican they were rescued largely through the efforts of the University of Michigan Greenland Expedition members under Professor William H. Hobbs. The flyers, who planned to alight at Mt. Evans, Hobbs' headquarters, were within 50 miles of their destination when forced down.

Graf Zeppelin.—On October 11, the *Graf Zeppelin* left Friedrichshafen, Germany, with a large crew under Dr. Hugo Eckener and passengers and arrived at Lakehurst, N. J., on October 15. Storms forced the dirigible to a southern route and an accident decreased the speed of the dirigible. The Zeppelin carried 20 passengers, a crew of 40, mail, and freight. The dirigible left on her return trip on October 29 and reached Friedrichshafen on November 1. The western flight took 111 hours and the return trip 69 hours. Although the

R-34, British dirigible, in 1919 made the trip from Scotland to New York and return, the round trip of the *Graf Zeppelin* was a pioneer commercial flight.

MacDonald.—On October 17, Lieutenant Commander H. C. MacDonald left Harbor Grace in an 85 horsepower plane, the *Gypsy Moth*, for England, and after being sighted once by a transatlantic steamer disappeared at sea.

The transatlantic flights resulted during 1928 in a toll of 3 lives.

TRANSPACIFIC FLIGHT

The Fokker monoplane, *Southern Cross*, made a 7300 mile flight from Oakland, Calif., to Sydney, Australia, in "three hops." Captain Charles Kingsford-Smith, with Charles T. P. Ulm, relief pilot, Lieutenant Harry Lyon, navigator, and James Warner, radio operator, left Oakland on May 31 and reached Honolulu in 27 hours 28 minutes after a flight of 2400 miles. The second leg of the journey to Suva, in the Fiji group, 3138 miles, consumed 34 hours and 33 minutes and the third from Suva to Brisbane, Australia, 1762 miles, 19 hours 18 minutes. The Southern Cross is the fifth plane to succeed in crossing the Pacific to Honolulu. Only 8 out of 15 flyers previously attempting the crossing survived. The second day's flight of 3138 miles is said to be the greatest ever made over water by an airplane. The entire flight gave evidence of carefully prepared equipment, broad experience and skillful navigation.

During the entire flight the world was informed by wireless of the plane's progress, of the condition and attitude of the crew, of the storms encountered, and the obstacles overcome. The flight was generally accepted as evidence of the possibility of oceanic trips, notwithstanding the depression arising from the many unsuccessful attempts. The fact that the *Bremen*, the *Spirit of St. Louis*, and the *Southern Cross* were all monoplanes was the subject of some discussion. One report reads: "Experience tends to show that the monoplane is evidently more easily righted if affected by air conditions. Very few machines of this type are reported as going into a tail spin with fatal results. The *Southern Cross* survived a downward air current which it struck in mid-ocean and which is one of the conditions dreaded by aviators."

FIELD MUSEUM EXPEDITIONS

In the Orient.—The Field Museum-Oxford University Joint Expedition to Mesopotamia, making archæological excavations on the site of Kish, continued its work during 1928, being the sixth year of operations. The Field Anthropological Expedition to Arabia to collect materials bearing upon prehistoric man, begun during 1927 concluded its work during 1928. In addition to the MacMillan subarctic Expedition, the Field Museum during the year had in the field a zoölogical expedition in India.

Other Fields.—A botanical expedition was sent to South America, a party in search of Maya culture to British Honduras, and with others a botanical expedition to Panama. During October, 1928, the Crane Pacific Expedition to the South Sea Islands and the East Indies began a year's operations.

The Roosevelts in the Far East.—Colonel Theodore Roosevelt and Kermit Roosevelt have planned to explore the region lying northward of Indo-China, along the gorges of the Moking River and abutting the borders of Burma, Siam and Yunnan. The expedition will be known as the William V. Kelley-Roosevelt Expedition to Eastern Asia of the Field Museum.

AMERICAN MUSEUM OF NATURAL HISTORY

Africa.—James L. Clark of the Carlisle-Clark African expedition left in May to collect materials for the Akeley African Hall of the Museum. The party proceeded to Nairobi, British East Africa, the expedition's headquarters. With Mr. Clark are G. Lister Carlisle, Jr., and Mrs. Carlisle, W. R. Leigh, an artist who accompanied the late Carl Akeley to Africa, and C. C. Raddatz, of the department of preparation of the Mu-

seum. Leaving Nairobi the party spent four months in the field. They then plan to return through Uganda and the Sudan to Khartum and across the desert to Wadi Halfa, on the second cataract of the Nile, and from there travel down the river to Cairo.

Guatemala.—Dr. George Vaillant with Mr. Clarence L. Hay at the invitation of the Carnegie Institution carried out excavations at the site of Uaxactun, Petan, Guatemala, that yielded important information on the early history of the Maya race. He brought back a small synoptic collection of the ancient cultures of the Valley of Mexico.

The Stoll-McCracken Siberian-Arctic Expedition in the *Morrissey* under Captain Robert Bartlett sailed for the Siberian coast for a six or seven months' exploration. The expedition is financed by Charles H. Stoll and led by Harold McCracken, associate editor of *Field and Stream*. The party includes also Dr. H. E. Anthony, curator of Mammals of the Museum, R. B. Potter of the Museum and Edward Namley, radio operator. The search for the natural mummies of the post-glacial period was one of the objectives of the expedition. The party explored Czar Nicholas II Land, an island of unknown size north of Cape Chelyuska off the coast of Asiatic Siberia, about 600 miles south of the Pole. It studied the economic possibilities of Kamchatka, which is rich in timber, coal, gold, lead, zinc and other minerals, and in grazing lands. But it was concerned chiefly in hunting for the museum specimens of animals and birds of the north.

Roy Chapman Andrews completed his Central Asiatic Expedition of 1928. His principal archæological discovery for the season was at Erhlien, in eastern Gobi, where much was learned of early man and "Dune Dwellers" culture. Dr. Andrews reports the acquisition of 90 cases of fossils, a new mammal "possibly larger than Baluchitherium," a hugh titanothere, and a new mastodon.

The Tyler-Duida Expedition sailed during the summer by the way of the Amazon River and Manaos for Mount Duida.

NATIONAL GEOGRAPHIC SOCIETY EXPEDITIONS

Africa and South America.—The Smithsonian-National Geographic Society Expedition located on Mount Brukkaros in southwest Africa for the study of solar radiation continues their investigations. Further work was done also by the Society's research expedition towards clearing and reconstructing the ruins of the great Indian communal houses in the Chaco Canyon and in the study of Pre-Columbian civilization.

The Pavlov Volcano Expedition under the leadership of Dr. T. A. Jaggar completed the second summer's work among the chain of volcanoes of the Aleutian group. Newly discovered volcanic cones are reported. The main objective of the expedition is the collection of data on some of the more puzzling aspects of volcanism and the long festoon of islands extending a thousand miles from the Alaskan Peninsula with its varied stages of volcanic activity forms a vast laboratory for this study. A new crater, 4300 feet high, has been named Dana Volcano in honor of the great pioneer American geologist. Among and on the islands Dr. Jaggar has used an amphibious autoboat which is reported to be a great success.

Secondary features of importance in the work of the party include the study of a "near glacier" of large size consisting of ice, gravel, boulders, pumice, ash and sand; the discovery of a great group of pinnacled-formed peaks on the Aquileen Pinnacles, and the collection of data for a topographic map of 1500 square miles of unknown territory. The expedition's route lay from Squaw Harbor in Unga Island, in the Shumagin group, to Canoe Bay, head of Pavlof Bay on the Pacific side of the Alaska peninsula, then along the shore of the Pacific westward to King Cove. With Dr. Jagger were C. P. McKinley, topographic engineer; R. H. Stewart, photographer, and three others, as assistants.

OTHER EXPLORATORY PARTIES

New Guinea.—Dr. D. W. Brandes led an airplane expedition of the U. S. Department of Agriculture into the interior of New Guinea in search of new varieties of sugar-cane. One hundred and seventy-one distinct varieties were secured, including twenty wild kinds and one specimen wholly new to science. The expedition flying over the head-hunting tribes that live between the coast and mountains spent seven weeks on the upper Fly River, three weeks in the Owen Stanley Range and two weeks on the upper Sepek River. Data for a new map of the area were collected.

Africa.—The Chicago Geographical Society Expedition under Carveth Wells to the Mountains of the Moon in Equatorial Africa, reached the summit of Mount Baker on August 26. The Cameron-Cadle-Kalahari Desert Expedition sailed early in the summer in search of early human remains in Southwest Africa.

Cruise of "Carnegie."—The nonmagnetic survey yacht *Carnegie* left in May for a three-year cruise with 7 scientists and 17 seamen. The party was at Reykjavik, Iceland, July 20-27. All investigations have been carried out according to the original program, and the vessel is heading toward the South Atlantic. It is planned to return to the Potomac again in July, 1931.

SOUTH POLAR FLIGHTS

Byrd Expedition.—Attention during the coming season will be directed to the Antarctic Continent. Commander Richard E. Byrd is establishing a base of operations in the Bay of Whales, 2300 miles from New Zealand, and erecting cabins on the vast Ross Ice Barrier. There has been planned undertakings on a more extensive scope than any previous expedition. Provisions for air flights and land parties are expected to broaden greatly the knowledge of Antarctica. *The City of New York*, a small old-fashioned square rigged ice breaker boat, left New York in August with equipment and men. Later the *Larsen* with Commander Byrd on board followed.

Wilkins Expedition.—On September 22 Captain Sir George H. Wilkins sailed for Montevideo with 2 planes and 3 flight companions—Captain Carl B. Eielson, Joseph Crossman and Oral Porter. On October 24 the party left Montevideo for their base at Deception Island. Wilkins states that he does not plan to fly over the Pole but to spend 6 months in general exploration.

COGNATE SOCIETIES

American Geographical Society.—Broadway at 156th St., New York, N. Y.

Association of American Geographers.—University of Chicago, Chicago, Ill.

Explorers Club.—Cathedral Parkway, New York, N. Y.

Geological Society of America.—Columbia University, New York, N. Y.

Harvard Travellers Club.—Harvard Club, Boston, Mass.

National Geographic Society.—Washington, D. C.

Society of Economic Geologists.

DIVISION XXI

CHEMISTRY AND PHYSICS

INORGANIC AND PHYSICAL CHEMISTRY

By Hugh S. Taylor

Professor, Princeton University

STUDY OF ELEMENTS

Rhenium.—The search for the few missing elements in the series from hydrogen to uranium has not yielded, in 1928, any success; thus, there still remain elements 43, 85 and 87 as the prizes for such investigations. Element 43 was reported in 1925 by Noddack and Tacke along with Element 75, now known as *rhenium*, but all subsequent work on Noddack's part has been concerned with the latter. From various minerals Noddack has now collected some 120 mg. of the new element (*Z. Elektrochem.*, *34*, 627, 1928) and, with the assistance of the German Company, Siemens and Halske, is now preparing about one gram (1/32 oz.) of the element. The smaller amount represents about 80 times more than the amount available in 1927, and with it more has been learned concerning its properties.

The metal is a heavy gray powder which remains unchanged when heated in a vacuum even to 2000°C. It burns in oxygen at 300°C. and gives two characteristic volatile oxides; one, a colorless oxide melting between 26 and 30°C., the other, a yellow oxide melting at 160°C. The analysis of these oxides indicates that they are Re_2O_7 and ReO_3 respectively. The latter is soluble in water and from such solutions the properties of the metallic compounds in solution have been studied. Noddack concludes from these studies that *rhenium* behaves like an element intermediate between tungsten and osmium. Some physical constants of the element have been determined by Frau Ida Noddack (ibid., *34*, 629, 1928). The most interesting to the chemist is the atomic weight. The approximate determination from the specific heat of the metal gave 185, while a determination of the ratio of Re to S in the disulphide gave 188.7 with a probable error of ± 0.25. This will be checked later by analysis of other salts, especially the chloride $ReCl_6$. This value falls, as it should, between tungsten (184.0) and osmium (190.9) in the periodic classification of the elements.

Cæsium.—The discovery that elements having atomic weights markedly different from whole numbers were in reality mixtures of two or more isotopic forms of the same element, having different, but whole number weights, has lent a certain interest to the element cæsium (No. 55). The accepted atomic weight was 132.81 but no isotopes of the element were found by Aston in his studies of isotopes. The atomic weight was therefore suspect. A new determination, however, by Richards and Françon, in a posthumous publication of the late Professor T. W. Richards (*J. Am. Chem. Soc.*, *50*, 2162, 1928) confirms the accepted value and suggests, therefore, a renewed search for a cæsium isotope.

Atoms of Diatomic Molecules.—The discussion of the nature of active nitrogen still rages, but progress is being continually recorded. It is now generally admitted that active nitrogen is complex and that it probably contains atoms, both normal and ex-

cited as well as excited molecules. The work required to dissociate a molecule into its atoms is now presumed to be nearer 9 volts than 11, or, expressed in calories, 207,000 instead of 263,000 calories. An independent method of determining the heat of dissociation of hydrogen molecules into atoms (Bischowsky and Copeland, *J. Am. Chem. Soc., 50,* 1315, 1928) has given 105,000 ± 3500 calories in good agreement with the value deduced from spectroscopic data of 101,500 calories.

THE MECHANISM OF OXIDATION

Significance.—Renewed interest, of extraordinary intensity, in the phenomenon of oxidation as manifested in flames and explosions, is one outstanding characteristic of the chemical work in the preceding twelve months. The problem has not only a fundamental practical importance but it has been shown to have a very material theoretical significance. The interest has been mainly stimulated by the discovery of anti-knock materials, such as lead tetraethyl and iron carbonyl, for gasoline fuels. The theoretical study has shown these agents to have much in common, as far as mechanism of action is concerned, with inhibitors of oxidation and preventives of oxidation deterioration in rubber, oils and the like. This interest has caused world-wide study more especially in this country, England, Germany and Russia.

Relation to Engine Knock.—A useful summary, in elementary form, of the problem in its relation to engine knock has been given by Egerton (*Nature, 122,* July, 1928). In this paper he associates the action of anti-knock materials with the inhibitory action of added substances on what are known to chemists as "chain" reactions. These reactions are characterized by the production of energy-rich reaction products, the energy of which can be transferred to molecules of unreacted gas, causing them to become reactive. There is evidence that peroxides form an important step in the sequence of oxidation reactions and that they may give rise to some of the chains. The evidence, too, shows that the molecules of retarding agent suffer oxidation in exerting their action. Thus, benzene, which is an anti-knock agent, is oxidized to phenol when present in hexane-air and coal gas-air mixtures undergoing oxidation, and even in the relatively cold flames of carbon disulphide oxidation. (Mardles, *J. Chem. Soc., 133,* 872, 1928; Gill, Mardles and Tett, *Trans.* Farad. Soc., *24,* 581, 1928).

This conclusion is identical with that obtained in another type of autoxidation, that of sodium sulphite in aqueous solution. Alyea and Backström (*J. Am. Chem. Soc.,* Dec. 1928; *Trans.* Farad. Soc., *24,* 601, 1928) studied the effect of inhibitors quantitatively. They found that two molecules of alcohol inhibitors were oxidized for every sulphite chain started, if one assumed that the chains were 50,000 molecules long in the absence of inhibitors, a result which the previous work of Backström on the sulphite oxidation in absence of inhibitors had shown to be indicated by photo-chemical studies.

Reaction Tests.—An entirely new method of indicating the existence of chain reactions in combustion reactions has been deduced by Semenoff in Leningrad (*Z. Physik, 48,* 571, 1928) from the theory of bimolecular reactions and the dependence of explosion on pressure and temperature. He concludes that, when chain reactions occur in contradistinction to heat explosions, the lower limit of pressure below which explosion does not occur is practically independent of temperature. In heat explosions, on the other hand, the lower pressure limit decreases exponentially with temperature. Testing these views experimentally, he finds that the combustion of hydrogen, carbon monoxide, possibly pentane, phosphorus and sulphur occur by means of chain reactions. Semenoff also points out that the necessity, in many reactions, for the presence of minute amounts of water vapor is another index of the occurrence of chain reactions. In a later paper he cites a new example of this (*Z. physik. Chem.,* B, *1,* 192, 1928) by pointing out that the interaction of sulphur vapor and oxygen is

dependent on the presence of active centers in which reaction is initiated. Ozone may act as the exciting agent and initiate reaction between oxygen and sulphur greatly in excess of the amount of ozone introduced.

Hinshelwood and Gibson (*Trans.* Farad. Soc., *24*, 559, 1928) have furnished another illustration of the same kind. Nitrogen peroxide initiates the explosion of hydrogen and oxygen some 200° below the normal explosion temperature. Moreover, it only operates thus between well defined limits of peroxide concentration characteristic for each temperature. Below or above these limits no explosion occurs. Hinshelwood also concludes, with Semenoff, that the influence of these agents such as moisture, ozone and nitrogen peroxide is to be associated with the production of an exothermic reaction initiating a chain.

The existence of chains in another class of reactions is also demonstrated in an extended series of researches by Polanyi and his co-workers (*Z. physik. Chem.*, B, *1*, 3-73, 1928; *24*, 606, 1928). The reaction between sodium vapor and chlorine induces a reaction between hydrogen and chlorine, known from photo-chemical work to show long chains. Bromine can be shown to inhibit such a reaction. Quite apart from the problem of chain reactions these studies of Polanyi are of the first importance. They comprise a series of investigations of "elementary reactions," in which, at every collision, reaction occurs between a free atom A and a molecule BC to yield AC + B, if the direction is that in which heat is evolved. The reactions are studied at low pressures and yield light as the result of secondary reactions which produce energy-rich molecules capable of exciting atoms, by collision, to light emission. In addition to chlorine, Polanyi has studied iodine, bromine, mercuric chloride and stannic chloride in interaction with sodium, zinc, cadmium, magnesium and metalloids such as arsenic and phosphorus. In every case abundant induced reaction was noted.

Chemistry of Flames.—For many years, Haber and his co-workers have studied in detail the structure of flames and the reactions occurring within them. In conjunction with Bonhoeffer, he has this year published (*Z. physik. Chem.* 137A, 263, 1928) a further contribution to the subject in which the chemistry of the problem is now attacked with the aid of the newer thermal data involving the energy of the atom linkages in the reacting gases and also from the standpoint of band spectra of the flames. In the hydrogen-oxygen flame, the spectroscopist has recognized the presence of OH bands. Bonhoeffer and Haber conclude that the reaction $2H + O_2 = 2OH$ is important and that interaction between molecular hydrogen and hydroxyl (OH), according to the equation $H_2 + 2OH = 2H_2O + 2H$, regenerates atomic hydrogen, thus setting up a chain mechanism for the total reaction $2H_2 + O_2 = 2H_2O$, which is required by the considerations advanced in previous paragraphs. The presence of OH in the flames accounts for the minimal amounts of hydrogen peroxide (H_2O_2) obtained from such flames under special conditions. The hydrogen atoms required for the chain mechanism are produced, so Bonhoeffer and Haber assume, by collision between hydrogen molecules and energy-rich water molecules formed by interaction of hydrogen atoms and hydroxyl. These latter interactions would break the chains discussed above, but the regeneration of hydrogen atoms would start chains afresh.

The carbon monoxide flame requires, as is well known, the presence of moisture for its production. Bonhoeffer and Haber see in this a possible reaction involving hydroxyl and the production of atomic hydrogen, $CO + OH = CO_2 + H$. The atomic hydrogen thus present might account for formaldehyde since its production from atomic hydrogen and carbon monoxide is now known. In the flames of hydrocarbons the spectroscopic data indicate the presence not only of a di-carbon C_2 but also of a methine radical CH. The presence of this latter points to a reaction $C_2 + OH = CO + CH$, whence, also, by the reaction $CH + OH = CO + H_2$ the

breakdown of hydrocarbons to carbon monoxide and hydrogen would be understandable.

The spectral analysis of reactions in progress is teaching the chemist daily more and more that, in the change from one set of stable molecules to another, the transitory existence of radicals such as OH, NH, CH and the like must necessarily be assumed.

THERMODYNAMICS

Also, in the calculations of chemical equilibria, the new developments in physical interpretation of spectra are providing the student of thermodynamics with new methods of solving his own particular problems. This is well illustrated in two papers on the entropy of hydrogen chloride and bromide by Giauque and Wiebe (*J. Am. Chem. Soc., 50,* 101, 2193, 1928). The classical methods of entropy determination from specific heats and the thermal data are here checked by calculations from the energy levels of the molecules as given by band spectra. In both cases the theoretical and observed values agree well, a result which confirms the third law of thermodynamics by a new method since, in obtaining the observed data, the third law is assumed and is not assumed in the calculations from band spectra. As a by-product of this research, Giauque and Wiebe believe they have found a third crystalline form of hydrogen chloride which has a reddish pink color.

STUDIES AND DISCOVERY

Molecular Weights of Colloidal Particles.—Svedberg is rapidly extending his studies of centrifugal sedimentation equilibria and of sedimentation velocities to the determination of the important property of molecular weight of colloid particles. Two papers (*J. Am. Chem. Soc., 50,* 535, 1399, 1928) add to the list already known. Phycoerythrin and phycocyan, two proteins of the globulin type, have molecular weights 208,000 $\pm$ 80,000 and 106,000 $\pm$ 5000 respectively. Hæmocyanin, the respiratory blue pigment of the blood of certain lower animals, has a weight of 5,000,000 $\pm$ 5 per cent. This is a particle of size just beyond the limit of visibility in the ultra-microscope. Svedberg's method permits, however, an accurate estimate of their size. There is room for the extension of such studies to other colloidal systems than the biological.

Raman Effect.—A new effect was discovered this year by the Indian scientist Raman, in which light of a given frequency falling on matter is scattered by the material at frequencies which differ from the incident frequency by amounts which are characteristic of the infra-red frequencies of the scattering medium. By this method, a number of workers have shown that it is possible to learn something of the infra-red spectra of chemical compounds in a region of the spectrum not accessible to measurement in any other manner. Since infra-red spectra indicate the nature of atom binding in compounds the results obtained have a great interest for students of chemical constitution. Study has shown that the Raman effect may be both positive and negative; wave lengths of scattered light shorter than the exciting wave length making their appearance as well as longer wave lengths. These results constitute a strong experimental proof of the quantum theory of energy change in material systems. A vigorous prosecution of this new field is to be expected.

Photochemistry.—Bonhoeffer is responsible for a very definite new contribution to photochemical interpretation (*Z. physik. Chem., 134,* 337, 1928). He concludes that the so-called "diffuse" band spectra indicate that the absorbing molecules giving such spectra may break into fragments on absorption of light without suffering collisions. He applies this to the photochemical decomposition of ammonia. The fragments in this case are probably initially NH_2 and H, although definite proof of this is not forthcoming. There is a considerable list of molecules giving diffuse spectra upon which this idea can be tested.

The nature of chemical binding and the structure of atoms formed the principal theme of the German Bun-

sen Society meeting during the present year. The main addresses have been printed (*Z. Elektrochem., 34*, September, 1928). The several contributions indicate how the new quantum mechanics, the electrical, crystallographic, photochemical and thermal properties of compounds are being utilized to learn something of the inner nature of molecular structure. This is at the present time the principal concern of much of the real fundamental work in general and physical chemistry.

ORGANIC CHEMISTRY

By Charles D. Hurd

Associate Professor, Northwestern University

PETROLEUM AND HYDROCARBONS

Gasoline Vapor-Phase "Cracking."—Since much of the present-day gasoline is produced by the thermal decomposition of crude mineral oil, it is of interest to note that vapor-phase "cracking processes" are coming into prominence. As contrasted with liquid-phase processes which have been largely used, there are not only advantages but disadvantages. Vapor-phase processes, however, appear to produce gasoline which has a high anti-knock value, and it is this property which is particularly desirable at the present time. In fact, an appropriate anti-knock value is the criterion of good gasoline at present: previously, gasoline had been largely judged by color, odor and density. In this connection, McKee and Parker have demonstrated that the critical temperature of aliphatic hydrocarbons (that is, the temperature below which the substance cannot exist as a liquid, regardless of pressure) is only about 170-200° higher than the boiling point of the hydrocarbon. From this, McKee points out that the designation of several of the commonly used oil-cracking processes as "liquid-phase" is probably without justification.

Mechanism of "Cracking" Reaction.—To study the mechanism of the "cracking" reaction, several pure hydrocarbons have been intensively studied. Little can be learned from the cracking of petroleum itself, inasmuch as it is such a complex mixture. Pease has shown that at 600° C. the gas ethane decomposes reversibly into ethylene and hydrogen. He has also studied the rates of decomposition of propane and butane. Frey and Smith, and also Hurd and Spence, have made similar studies with pure aliphatic gaseous hydrocarbons. As regards the mechanism of such pyrolyses, evidence seems to indicate a preliminary scission of the molecules into radicals. These cannot be isolated, but they react at once to give new compounds. In the Chandler Medal address of the past year, Professor Gomberg remarked that it is becoming more and more customary to interpret the mechanism of many reactions by first assuming scission into radicals. Midgley's study of the dry distillation of rubber is also in accord with this conception.

Hydrocarbon Gases.—An electrical discharge produces startling effects when it is exposed to saturated hydrocarbon gases. Lind and Glockler have thereby produced liquid hydrocarbons from ethane, and in a measure they have been able to regulate the molecular complexity of the resultant mixture, by controlling the time of contact. The preparation and properties of pure hydrocarbons have attracted a number of workers. Thus, Maass prepared the pure butanes and butylenes to study their physical constants. The varying rates of absorption of the butylenes in sulphuric acid was investigated by Davis, and the use of sulphuric acid solutions of definite concentration has been developed by Hurd and Spence into a quantitative method for the analysis of a gaseous hydrocarbon mixture. Salzburg and Marvel have synthesized hexa - *tertiary* - butylethynyl ethane. Structurally, this somewhat resembles hexaphenylethane, but unlike the lat-

ter it shows no tendency to dissociate into free radicals. From an investigation of the polarization of isomers of heptane, Smyth and Stoops conclude that the atoms in a saturated hydrocarbon molecule may be joined together in every possible configuration without giving rise to any measurable lack of electric symmetry.

CARBON MONOXIDE AS RAW MATERIAL FOR SYNTHESES

Ever since the announcement of the methanol synthesis a few years ago, chemists have been interested in studying the various methods whereby hydrogen and carbon monoxide (water gas) may be made to combine. This past year, Fieldner, Brown and Galloway have shown that a 20 per cent yield of methanol may be realized at 400° C. and 180° atmospheric pressure, over a zinc chromate catalyst. In a similar study, Frolich has used catalysts composed of copper and zinc, and also of iron, impregnated with alkali. With the latter, he noted the pronounced tendency for side reactions giving rise to carbon dioxide, carbon, methane and water. That more complex organic compounds may also be formed is evident from D. F. Smith's work with a cobalt-copper-manganese oxide catalyst. At 275°, there is formed one gallon of liquid fuel (hydrocarbon mixture, rather than an alcohol mixture) from 1400 cubic feet of water gas. According to Storch, the addition of chromium oxide to a zinc oxide catalyst will promote the activity of the latter for a methanol synthesis without affecting its activity for the reverse reaction at atmospheric pressure.

The catalytic decomposition of methanol over metallic oxides, especially zinc oxide admixed with others, has been investigated by Smith, by Frolich and by Adkins. Zinc oxide alone is active only above 325°. It differs from alumina in its catalytic behavior since it fails to give rise to the formation of dimethyl ether.

OTHER CATALYTIC PROCESSES

The dehydration of alcohol into diethyl ether may be effected by alumina. Alvarado reported an 82 per cent yield at 269°. Adkins has studied the catalytic oxidation of other alcohols by air, and Milas has oxidized primary alcohols to esters by chlorates, using a vanadium pentoxide catalyst.

The inhibition of the oxidation of sodium sulphite solutions by alcohols has been shown by Taylor to vary markedly for different alcohols. Extinguishing fires is, of course, inhibition of one type of oxidation. In this connection, therefore, it is interesting to record Thomas and Hochwalt's discovery that diluted solutions of potassium salts, if forcefully ejected at a flame, are very much more effective in putting out fires than is water alone. Stephens has noted the inhibitory effect of water on the gradual air-oxidation of hot xylene into toluic aldehyde. In this connection, it is of interest to record the oxidation of methane by nitrogen pentoxide at the minimum reaction temperature of 430°, as related by Frolich, Harrington and Waitt. They suggest that methanol is the initial product of the oxidation, but the elevated temperature of the process precludes the possibility of isolating it. Formaldehyde is an isolated product.

A satisfactory synthesis of methylamine from methanol and ammonia at 325° over thoria has been reported by Davis and Elderfeld. It has been known for some time that acetylene behaves as "anhydro acetaldehyde" when in the presence of mercuric sulphate. With this catalyst, Nieuwland has effected the union of acetylene with resorcinol and with aromatic hydrocarbons.

A platinum oxide,—platinum black catalyst in glacial acetic acid as a medium—has been found to be very effective in the reduction of aromatic hydrocarbons or of pyridine types into their hexahydro analogs. The method works well even at room temperature, a behavior that demonstrates the efficiency of the catalyst. These are the results of Adams and co-workers. According to Brown, Etzel and Henke, various aromatic nitro compounds, such as dinitrotoluene, may be reduced at high pressure and

at 215° with a nickel catalyst. By using palladinized charcoal as a catalyst, Hartung has effected the reduction of several nitriles or oximes into amines.

ORGANIC MEDICINALS

Jalapinolic acid occurs in a resin from a Mexican plant, whose roots have been used as purgatives for many years. Adams has proved that this acid is identical with *d*-11-hydroxy-hexadecanoic acid. If the purgative action is due to the alcoholic hydroxyl group, it is of interest to point out that ricinoleic acid, obtained from castor oil, also possesses a similar alcoholic hydroxyl group. Adams has also effected the synthesis of homologs of ephedrine, and of several disubstituted acetic acids related to chaulmoogric acid. These acids all contained at least one alicyclic ring, and in all cases, acids containing 16 and 18 carbon atoms were found to be highly bacteriocidal towards *B. Leprœ*. Whereas one alicyclic ring seems to be essential for this effect, it is not amplified when two such rings are present. Hamilton and Etzelmiller report the preparation of some organic antimonials for use with investigations of protozoal diseases.

Shriner and Ko have prepared derivatives of cholesterol. A new series of efficient local anesthetics possessing low toxicity has been described by Sandborn and Marvel. These are *p*-aminobenzoate esters of N-alkyl-β-piperidinyl carbinols. Also, Thayer and McElvain have prepared a series of 3-methyl-piperidino-alkyl benzoates for pharmacological study. A compound somewhat related to "mustard gas,"—namely, β-chloroethylmethyl sulphide, has been shown by Kirner to be a powerful vesicant.

Ethylene oxide, esters of formic acid, trichloroethylene and methyl chloroacetate have been found to be effective in small concentrations for the killing of moths and beetles. No contact insecticide has as yet been found to approach the natural products [pyrethrins, rotenone (from derris), or nicotine] in effectiveness, but LaForge is approaching this problem by studying various pyrrolidine and pyridine derivatives. Wright has established the formula of rotenone as $C_{23}H_{22}O_6$.

CARBOHYDRATES

"Bios" is a name given to a mysterious organic material which is essential for the proliferation of yeast cells. This controversial subject seems nearer of solution, in consequence of W. Lash Miller's findings that Bios I is inosite, or hexahydroxycyclohexane. Bios II is still unidentified. Carotin has been shown to be one of the substances responsible for the color of buckwheat honey, and Schuette has succeeded in isolating it in 0.01 per cent yield. In a study of maple sirup, Nelson has discovered that the flavor depends very largely on an unstable phenolic body which is associated with an aldehyde resembling vanillin. Extremely sweet compounds are rare. Therefore, it is of interest to record that *n*-amyl-chloromalonamide, as prepared by Dox and Jones, is 400 times sweeter than sugar.

The fact that the American Chemical Society Institute devoted seven out of its twenty-eight general conferences to a discussion of the ways whereby chemistry may assist in the utilization of farm products other than for food and clothing is highly significant. Several articles on carbohydrate wastes have already appeared, and these will be multiplied in the near future. Thus, studies have been made on the problem of extraction of lignin and xylose from corn cobs, cottonseed bran, peanut hulls or oat hulls. Uses for xylose are being sought, and also uses for the trihydroxyglutaric acid which can be prepared from it readily by oxidation. Derivatives of lyxose have been studied by Phelps and Hudson, and by Levene and Wolfrom.

From oat hulls, furfural has been prepared commercially for a number of years and new uses for it are constantly being sought. It has been found that crude anthracene may be purified to a remarkable degree by crystallization from furfural. This has immediate industrial considerations in the preparation of anthraqui-

none, and hence, of vat dyes. Many investigators have also studied the chemical behavior of furfural and its derivatives.

Evans has reported the action of alkali on hexoses, and Lewis, Wolfrom and Greene have studied its effect on methylhexoses. It is interesting that glucosone has been found to be an important oxidation product of glucose or fructose when cupric acetate is used.

METALLO-ORGANIC COMPOUNDS

As usual, considerable study has been given to the organo-magnesium compounds. Thus, α-olefines are prepared by the action of "Grignard reagents" with allyl bromide; primary amines with monochloroamine; monochloro derivatives of hydrocarbons with chloropropyl toluenesulfonate; glycollic esters with ethyl oxalate; etc. Examination of the gases evolved during the preparation of alkyl magnesium halides makes it appear that their origin is due to various reactions of free radicals (Gilman and Fothergill) which are probably momentarily formed in this reaction. It is well known that aluminum cannot be deposited electrolytically from its inorganic solutions, but Keyes has found that the electrodeposition of aluminum is fairly simple if ether solutions of diethyl aluminum iodide or ethyl aluminum diodide are used.

BENZENE DERIVATIVES

For years, the commercial synthesis of phenol has involved sulfonation of benzene and subsequent fusion with alkali. To replace this irksome process, Hale and Britton use direct hydrolysis of chloro- or bromo-benzene at 370° with very high pressures (3-4000 lbs. per sq. inch). In commenting on "drip oil" from manufactured city gas as a source for indene and styrene, Brown calculates that about 8.5 million gallons of this oil is our annual supply, as yet almost untouched as an organic raw material. Its composition is one-eighth styrene and one-fourth indene. Conant and Blatt have effected the condensation of styrene homologs by sodium-potassium alloy, and have used this means of studying the nature of the hydrocarbons in petroleum.

MISCELLANEOUS

Other work to receive mention is Jones' study of alkylated hydroxylamines; Kohler's, of isoxazoles; Fuson's, of the reaction mechanism of diethylamine and ethyl dibromoadipate; Gomberg's, of the tautomerism of hydroxy-triarylphenols; Fieser's, of the tautomerism of hydroxyquinones; and Adams', of isomerism in the diphenyl series. In connection with the structure of diphenyl, Williams and Weissberger have shown that the electric moment of dinitro- and dihydroxy-diphenyl is zero, whereas the moment of the diamino derivative is quite appreciable. From this, it has been inferred that the first two possess the regular extended formula, whereas the last has a folded structure.

Several workers have been interested in the basic properties of sodium acetate and related compounds when dissolved in glacial acetic acid. Articles have appeared by Hammett, Davidson, Hall and Conant. It has been shown by Conant that the rate of acetylation of β-naphthol by acetic anhydride in glacial acetic acid varies over a million fold, depending on the hydrogen ion activity of the solution. The process has been shown to be subject to both acid and basic catalysis.

AGRICULTURAL CHEMISTRY

By C. A. Browne

Department of Agriculture

Conference of the Institute of Chemistry.—The most important event of 1928 in agricultural chemistry was the conference of the Institute of Chemistry of the American Chemical Society at Evanston, Ill.,

during the week of July 23-28 upon the industrial utilization of agricultural waste products for other purposes than for food and clothing. This conference was participated in by chemists of the U. S. Departments of Agriculture and Commerce, and of several state colleges and also by experts representing various chemical industries and trade organizations. Papers were presented upon the industrial utilization of corn stalks, corn cobs, straws, hulls, shucks, and other agricultural wastes for the production of paper, fiber board, insulating board, cellulose, furfural, xylose, oxalic acid, acetic acid, methanol, illuminating gas, tar, charcoal, and other products of commercial value. The topics were discussed from the agricultural, chemical, technological and economic viewpoints with special reference to the broad general problem of devising methods for relieving the present depressed condition of the farming industry.

LIGNIN

Need For Research.—The constituent of agricultural cellular materials upon which there is the greatest need for chemical research is lignin. Next to cellulose and possibly the pentosans lignin is the most abundant and most widely distributed plant substance; it is found to the extent of 20-30 per cent in the "lignified" or woody portion of such crop materials as stalks, straw, hulls, cobs, shells, etc., yet very little is known about its chemical constitution or about the methods for its industrial utilization. The following table gives some idea of the quantities of lignin produced annually in the United States in six common crop residues:

POTENTIAL SOURCES OF LIGNIN

Raw Material	Annual Production (tons)	Contents of Lignin (tons)
Corn stalks	100,000,000	20,000,000
Corn cobs	20,000,000	5,000,000
Cereal straws ...	60,000,000	12,000,000
Oat hulls	3,000,000	660,000
Flax straw	2,200,000	440,000
Cottonseed hulls.	1,800,000	450,000
	187,000,000	38,550,000

Utilization of Waste.—If there be added to the above the amount of lignin occurring in rice hulls, peanut shells and numerous other cellular by-products, the total lignin content of the crop residues produced annually in the United States will probably exceed 50,000,000 tons. The amount of waste lignin, which escapes each year from the paper mills of the United States with the pollution of its rivers and streams, exceeds 1,000,000 tons. The possible industrial utilization of this enormous wastage for the production of organic chemicals, dyestuffs, tanning materials, plastics and other products of commercial value is now engaging the attention of a large number of chemists. The present age stands with reference to the utilization of lignin very much as the world of a century ago stood with reference to the utilization of that formerly wasted by-product coal-tar, which now by the aid of chemistry yields annually many millions of dollars' worth of dyes, aromatics and other chemicals.

Lignin Content in Hay.—The lignin content of the annual hay crop of the United States exceeds 20,000,000 tons, yet very little is known of the manner in which this important constituent of the ration of farm livestock is utilized in the animal organism. Contrary to the general belief that lignin is not metabolized, Czonka and Phillips of the U. S. Department of Agriculture have found that fifty per cent of the methoxyl content of lignin is lost during digestion, and that after the ingestion of lignin the excretion of hippuric acid in the urine is increased by as much as forty per cent.

AGRICULTURAL WASTAGE

Surplus and Culls.—The industrial utilization of surplus and cull fruits and vegetables is another highly important phase of agricultural chemical technology. In California the unmarketable citrus fruits, which formerly cost the producer one dollar per ton to dispose of, now yield citric acid, lemon oil, orange oil, pectin, marmalade, cattle feeds and other products to the value of nearly one

million dollars annually. Similar efforts are now being made by scientists in the Department of Agriculture for the utilization of cull sweet potatoes which are estimated to make up about 25 per cent of the total annual crop of 94,000,000 bushels. The production of sweet potato starch is about to be established as a new agricultural chemical industry in Louisiana and other Southern States.

Deterioration of Products.—Another great wastage in agriculture results from the deterioration of grain, fruits, vegetables, feedstuffs and other farm products. It has been estimated that the losses sustained by American agriculture and by the industries which utilize agricultural products, as a result of the deterioration of foodstuffs, amount each year to several hundred millions of dollars. The destructive agencies involved in producing these enormous losses may be classified under four general heads: (1) Enzymes; (2) Microörganisms; (3) Atmospheric Influences; (4) Internal Chemical Changes. In the majority of instances of deterioration of food products, not one but several of these factors are involved. Plant enzymes break down the material into substances that are easily attacked by microörganisms; the latter in turn secrete enzymes which decompose further quantities of the product; many substances of enzymic origin, such as invert sugar, attract atmospheric moisture which in turn favors the growth of bacteria and molds; the amino acids, sugars, aldehydes and other compounds of enzymic and microbic origin react together with the production, by internal chemical changes, of substances which still further impair the value of the commodity. The cycle of deteriorative changes is thus exceedingly complex. The chemist must study carefully the peculiar characteristics of each individual commodity and summon to his aid that method (such as sterilization, pasteurization, dehydration, cold storage, etc.) which is most effective in preventing deterioration, and at the same time is least detrimental in impairing the appearance, flavor, aroma, palatability and nutritive value of the product.

INSECTICIDES

The annual loss to agriculture in the United States from the depredations of insects has been estimated to exceed two billion dollars. The agricultural chemists of the country are constantly engaged in the search for new fumigants, contact poisons, stomach poisons, repellants, and other agents to combat more effectively the attacks of the insect enemies of crops and livestock and at the same time to offer fewer hazards to the health of man and animal. Arsenic, in the form of its various copper, calcium and lead compounds, is the substance used at present most extensively as an insecticide in the United States, the estimated annual production of the leading arsenicals being 5,000,000 pounds of Paris green, 25,000,000 pounds of lead arsenate and 30,000,000 pounds of calcium arsenate.

Because of the repeated extensive use of some of these chemicals in combatting the coddling moth and other insects there is sometimes left adhering to certain fruits and vegetables amounts of arsenical residues that are in excess of the usually accepted limit of 0.01 grain of arsenic trioxide per pound of fruit. The impending damage to the markets for American produce from this cause and the threatening injury of contaminated products to the public health have necessitated extensive investigations by Federal and State Chemists (1) to devise easily applied satisfactory methods for removing the excess of arsenic residues from sprayed fruit, (2) to begin a wide search for other insecticides which will be free from the dangers to the public health involved by the presence in food of arsenic and lead.

Bulletin 226 of the State of Washington Agricultural Experiment Station for May, 1928, upon the removal of arsenical spray residue from apples and pears, leads to the conclusion that none of the present methods of spray removal will guarantee a reduction of the As_2O_3 content in all cases below the international tol-

erance of 0.01 grain per pound of fruit. The most recent results on spray removal of the Washington State Laboratory at Wenatchee show that by the generally used method of hydrochloric acid washing 12.1 per cent of the washed fruit containing As_2O_3 in excess of 0.01 grain per pound, while with the method of dry wiping the percentage was 31.8 per cent. Myers and Throne of the New York Skin and Cancer Hospital believe the constant ingestion of traces of arsenic, even as low as 0.01 grain per pound of food, do produce deleterious physiological results and advocate not only the rejection of this tolerance but the complete elimination of arsenic from food.

HUMAN AND ANIMAL NUTRITION

Vitamin B.—The results of vitamin investigations in the United States during the past year confirm previous announcements regarding the multiple nature of the so-called Vitamin B. Goldberger and his coworkers of the U. S. Public Health Service have demonstrated that in addition to the long recognized antineuritic properties of this vitamin there is an additional heat-stable factor which has the property of preventing pellagra. Wheat germ, according to the Public Health Service workers, has a high content of the new antipellagric vitamin. It is yet too early to predict the results of this discovery upon the elimination of pellagra from the areas of its occurrence in various parts of the United States.

Artichoke For Diabetes.—Studies have been conducted by Carpenter and Root of the Nutrition Laboratory of the Carnegie Institute upon the value of the tubers of Jerusalem artichokes as a food for diabetics. Their results show an assimilation of the carbohydrates of the artichoke without the elimination of sugar in the urine which diabetics experience after eating sugar, starch and amylaceous foods. The explanation for this property of the Jerusalem artichoke still remains to be determined.

HERMAN FRASCH FOUNDATION

This new provision for Chemical Research in Agriculture under the bequest of Elizabeth Blee Frasch for "research in the field of agricultural chemistry" (announced on page 897 of THE AMERICAN YEAR BOOK for 1925), first became available in October, 1927. The annual amount of the income from this bequest is about $40,000. The awarding of grants from the income of this foundation under the terms of the bequest has been entrusted to a committee of the American Chemical Society.

ELECTROCHEMISTRY

By COLIN G. FINK

PROFESSOR, COLUMBIA UNIVERSITY

GENERAL DEVELOPMENTS

The outstanding features of the American electrochemical industry during the year 1928 are the following: the rapid growth of the aluminum and electrolytic zinc industries, the development of a commercial method for the production of beryllium (the new, light metal for airplane construction), commercialization of the process for plating on aluminum, the universal adoption of chromium plating with about 200 plants in operation in this country alone, and the consolidation of the major nickel interests. Toward the close of the year the American Electrochemical Society announced the establishment of two $25,000.00 funds, the one the Goodrich Acheson Fund, established by Dr. Acheson of graphite and carborundum fame, and the other the Edward Weston Fund, established by Dr. Weston, known throughout the world for the Weston Standard Cell (upon which the international volt is based) and for the highest type of electrical measuring

instruments. The interests of these funds are to be devoted for the promotion of pure and applied electrochemistry both in America and abroad.

ELECTRIC FURNACES

In the electric furnace field the induction furnace, in particular the Ajax-Northrup type, has gained universal favor. The new installations in 1928 amounted to 15,000 kw. as compared to 1500 kw. in 1923. The arc furnace installations have grown apace, the steel and alloy industries fully realizing the advantages of high temperature and rapid operation.

Of the various products manufactured in the electric furnace, the heavy tonnages of ferro-chromium are particularly noteworthy, due largely to the increasing demand for special chrome steels, among others those of the "stainless" type. In the operation of the arc furnaces there has been a marked tendency toward employing carbon electrodes of larger cross sections. One of the minor products of the electric furnace which, however, is attracting world-wide attention, is tungsten carbide, with the addition of other carbides such as cobalt carbide. The product is extremely hard and resistant to abrasion, and is being used more and more as a substitute for diamond for cutting-tools. Finally, we should record the conquest by the electric furnace of the glass-making field. This has been one of the most difficult applications, and the final solution of the problem is a fine compliment to the engineers directly responsible.

FUSED ELECTROLYTES

Aluminum.—The large aluminum plant at Arvida, Canada, has a capacity almost equaling that of the world's annual aluminum production. It is of interest in this connection that the Graf Zeppelin required 30 metric tons of duraluminum, an aluminum-rich alloy, for the metal structure. Aluminum sheets were used for the construction of the gasoline, oil and water tanks, and aluminum powder was used as a protection for the outer fabric cover. The propeller of Col. Lindbergh's historic aeroplane in which he flew from New York to Paris was made of forged, heat-treated aluminum. Aluminum has been successfully introduced in the construction of street railway cars. Their weight is 30% less than that of a steel car of the same size, and they require only 22% as much power to operate as the same car in steel. Such cars are in operation in Cleveland and other cities. Dr. Victor Hybinette introduced into commerce a new aluminum alloy containing a little nickel and certain metals of the chromium group. It is a general-purpose alloy. It can be rolled into sheets, drawn into wire, extruded and stamped. It is very resistant to corrosion, and has a polished surface remaining bright indefinitely in the atmosphere.

Magnesium.—The production of magnesium, the second metal of importance in the fused electrolyte industry, has had a very successful year, the production being far in excess of the previous year. The Dow Chemical Company of Midland, Mich., is now the chief producer in America.

Beryllium.—A recent newcomer, beryllium, is now commercially produced by the Beryllium Corporation of America in Cleveland. Its specific gravity is about ⅔ that of aluminum. It is the lightest of the known inert metals. It is extremely hard, scratching glass readily, and in this respect differs sharply from both aluminum and magnesium. Beryllium takes a high polish and remains untarnished in the air. It is only slightly attacked by reagents which readily corrode aluminum and magnesium. Its melting point is about 1825° C, which is about that of steel. Beryllium is of particular interest to the aeronautical engineer. A small percentage of beryllium alloyed with aluminum adds both strength and resistance to corrosion. As little as 3% beryllium added to copper produces hard bronze. An important application is the beryllium plate used for emergence windows in x-ray tubes. Beryllium will transmit x-rays 17 times as well as the aluminum plates generally used hitherto.

AQUEOUS ELECTROLYTES

Chlorine.—At Charleston, W. Va., the Westvaco Company installed 2240 Vorce cells. The cells were put into operation, the capacity being 60 tons of chlorine per day at a power efficiency of 62.1%. With this added new installation the Westvaco plant is now the largest electrolytic chlorine and alkali plant in the world.

Electrolytic Zinc.—The electrolytic zinc production of America has increased by 20% over last year. New installations were put into operation by the Anaconda Copper Company in Montana, by the Bunker Hill & Sullivan Mining Co. at Kellogg, I., and finally a new Tainton plant in the Joplin district. This last installation is particularly noteworthy since it was only a short time ago that engineers of the Joplin district considered the electrolytic zinc process far too costly to compete with the retort process universally used in the Joplin district.

Chromium Plating.—In electroplating, chromium plating continues to dominate the field. Applications are most diversified. Special mention should be made of the chromium-plated oil stills, and the plated stills resisting the attack of sulphur contained in the oil. Another application is the use of chromium-plated steel dies for drawing seamless nickel tubing. A universal application is chromium-plated hardware for marine fittings. Chromium-plated stellite metal mirrors promise to displace entirely silver-coated glass mirrors used in television and astronomical apparatus. The chromium-plating interests have been merged and consolidated in the United Chromium, Inc., of New York.

Cadmium Plating.—Another serious competitor of nickel-plating is cadmium plating. Three American companies are promoting the use of cadmium as a protective coating for steel and other metals: the United Chromium, Inc., Grasselli Chemical Company of Cleveland, and the Roessler & Hasslacher Company of New York. Cadmium-plating costs are less than nickel-plating costs. The cadmium coating is a real protection to the steel underneath. A number of large corporations such as the Westinghouse Manufacturing Company are using cadmium-plated parts to a very large extent.

Universal application of chromium plating and the introduction of the plate into such lines as table wear, percolators, etc., have brought about very serious competition with silver-plated wear, in consequence of which there has been intensive research in developing a non-tarnishable, hard, silver plate.

Gold Plating.—An important accomplishment in gold plating is the production of gold leaf by electrolytic means which is better and cheaper than the gold leaf made by the gold-beating process handed down to us from the ancient Egyptians.

Research.—Prof. F. C. Mathers of Indiana University has produced massive blocks of pure tellurium by electrodeposition. A smooth deposit of pure thallium was prepared by Prof. O. W. Brown and Sister Amata McGlynn of Indiana University. Harold K. Work of the Mellon Institute of Pittsburgh has perfected a process for plating nickel, chromium and other metals on aluminum. Colin G. Fink and James D. Prince of Columbia University have discovered a new method of making oilless bearings by the electrochemical co-deposition of copper and graphite. A research which has a very important bearing on the interpretation of various electrolytic processes is that conducted by Professors Kahlenberg and French of the University of Wisconsin, "on the nature of gas-metal electrodes." They find that an electrode potential of any metal is very largely dependent upon the gas within and above the electrolyte. The potential may vary by as much as half a volt with change of atmosphere.

ORGANIC ELECTROCHEMISTRY

Rubber.—The electrodeposition of rubber as recorded in 1925 is a commercial success. The Rome Wire Works are depositing rubber on copper wire by a continuous feed process, and tests on the finished wire indicate that the product is superior

to rubber-covered copper wire made by older processes.

Investigation. — Prof. Alexander Lowy of the University of Pittsburgh and Prof. C. J. Brockman of the University of Georgia have been most active during the past year in developing the electrolytic process for the production of various organic chemicals. David M. Greenberg of the Medical School, University of California, has carried out an elaborate investigation on the electrochemistry of the proteins. His results indicate a salt-like behavior rather than the current collodial theory of protein behavior.

CORROSION

Dipping Baths.—The prevention of the corrosion of steel and the prevention of the corrosion of aluminum and its alloys have occupied the center of the stage. Dipping baths have been developed for aluminum and its alloys whereby highly resistant coatings are formed. The important constituent in these dipping baths is chromic acid or an alkali chromate.

Protecting Boiler Tubes.—L. O. Gunderson of Chicago has published details of an improved process for the electrolytic protection of boiler tubes. In addition to the iron anodes as used heretofore, and an applied electromotive force of 0.002 amperes per square foot, Gunderson adds a soluble arsenate to the boiler water. A very adherent film of hydrogen is produced on the surface of the boiler tubes and local couples and currents are pratically eliminated.

The Tin Can.—Results on the corrosion in the tin can used for the preservation of vegetables and fruits were presented by Roger H. Lueck and Harold T. Blair of the American Can Company. They found that in acid solutions free from appreciable concentrations of oxidizing substance the usual electrochemical relations of tin and iron are reversed, tin assuming an anodic relation to iron.

CELLS

Dry Cells and Rectifiers.—Bruce K. Brown and Oliver W. Story of the Burgess Laboratories at Madison, Wis., have developed a new dry cell in which graphitic oxide is used as a depolarizer. Farrington Daniels of the University of Wisconsin, investigating the Leclanche dry cell, concludes that the depolarizing action of manganese peroxide is due to tetravalent manganese ions which bathe the network of graphite particles which constitutes the cathode of the cell. E. W. Engle of the Fansteel Products Co. of Chicago has patented the addition of a small percentage of cobalt to the electrolyte of the tantalum-lead rectifier so commonly used in radio apparatus. A better and more efficient rectifier is the result.

Photo-electric Cells.—The new photo-electric cell using alkali metal vapors has displaced the older selenium cell except in a few instances. The new cell has found application in widely diversified fields such as automatic control of chemical apparatus, burglar alarms, and in analytical chemistry. New investigations are under way in developing a photo-electric cell using a liquid medium instead of the gas surrounding electrodes.

ELECTROCHEMISTRY OF GASES

Neon tube lighting has been accepted throughout the United States, in particular for advertising purposes. With the introduction of a little mercury vapor or the use of colored glass tubing, various artistic effects have been produced. A new gas-metal electrode has been developed for the neon tube. It consists of iron or nickel sheet, the pores of which are saturated with an indifferent gas such as hydrogen or nitrogen, or both. Neon tubes with this electrode show a much longer life than with the older electrode from which the gases have been more or less completely removed. A small neon lamp invented by D. McFarlan Moore is used in television, in particular.

FIXATION OF ATMOSPHERIC NITROGEN

Synthetic Nitrate.—In spite of the scientific and technical developments that have taken place in the produc-

tion of nitrate from Chilean caliche, the natural deposit, and in spite of the outlook that 1928 will record one of the largest tonnages of Chilean nitrate in its history, nevertheless the production of synthetic nitrate or the fixation of atmospheric nitrogen has proceeded at an enormous pace, improving upon processes, and cutting down cost, so that today ammonia is, next to lime, the cheapest base per unit of alkali equivalent. Sulphate of ammonia sells today for ⅔ its pre-war price. Whereas in 1900 the world consumption of fixed nitrogen totaled 300,000 tons, in 1928 it amounted to almost the total of 2,000,000 tons.

Consumption and Cost.—According to W. S. Landis, the increase in nitrogen consumption throughout the world is about 80,000 tons per year. The largest single cost item in the manufacture of synthetic ammonia is that of hydrogen. A cheaper hydrogen is very much desired. About 60% of the American consumption of fixed nitrogen is in agriculture. Norman W. Krase and B. H. Mackey of the University of Illinois advocate the fixing of atmospheric nitrogen as hydrocyanic acid (HCN) at electric arc temperatures. The interaction of methane and nitrogen, and of acetylene and nitrogen, is complete at temperatures below 1700° C.

POWER FOR ELECTROCHEMICAL PURPOSES

The chief attention during the past year has been paid to the utilization of off-peak power for electrochemical power. Large power installations find it highly desirable to balance their load. A number of the companies have encouraged the erection of electrochemical plants to be operated full during the valley load and on a low current during the peak load. Electric furnace processes based on batch operation, and electrolytic processes where reduction of current to from 15 to 20% of the full load on current is not objectionable, are often suitable for off-peak power loads.

E. B. Dawson, General Engineer of the Westinghouse Electric and Manufacturing Company, discusses the relative merits of the geared, direct current, turbine driven generator for electrochemical purposes as compared with the alternating-direct current motor generator sets. The turbine-driven generator represents a lower first cost and a lower operating cost. Dawson emphasizes that to serve the electrochemical industries often requires very special electrical apparatus because it must usually operate continuously at practically full load, and sometimes under unfavorable atmospheric and temperature conditions.

INDUSTRIAL CHEMISTRY AND CHEMICAL ENGINEERING

By Sidney D. Kirkpatrick

Editor, *Chemical & Metallurgical Engineering*

ECONOMIC DEVELOPMENT

Statement of Herbert Hoover.—Herbert Hoover, then Secretary of Commerce, addressed a group of 500 executives of the chemical industry in Washington, Feb. 16, 1928. He made this statement: "By intelligent, persevering and constructive effort over a series of difficult years, the American chemical industry has established itself as a self-contained and essential part in the industrial and economic fabric of this country. Its problems have been faced with keen thought and determination. Many have been solved. Others, such as scientific and technical research, decrease in distribution costs, relationship to other industries, foreign competition and markets, have been solved only in part." This quotation is cited because it touches upon two apparently conflicting characteristics that during 1928 affected the economic development of the industry—namely, its self-sufficiency and its basic relation to other industries.

Industrial Interdependence.—Chem-

ical industry is self-contained in that a considerable proportion of its output is consumed within the industry itself in the manufacture of other chemical products. For example, the coal-tar refiner produces the crude, intermediate and semi-finished products which another branch of the industry fabricates into dyes, medicinals and other synthetic organic chemicals. A recent survey revealed that 75 per cent of the annual production of heavy chemicals is consumed within the chemical engineering industries. Nor is this interdependence confined solely to materials; the group is similarly related in its dependence upon common chemical and chemical engineering processes as well as upon the technically trained personnel that has developed and carried this technology into production.

Advantages of Consolidation.—Economic advantages accruing from this peculiar interdependence led to the formation of the great consolidations of chemical industries in Germany, England and France. Early in 1928 these great combines threatened a further consolidation into a mammoth world chemical trust. The move attracted international attention. The view held in some quarters that this was a part of an organized attack on American chemical industry was definitely proved to have no substantiation in fact. The basic relations that brought about these large aggregations of foreign capital, however, have been recognized on an increasing scale in the United States. During 1928 it became more apparent that logical economies were to be effected by merging various factors within the industry. There have been vertical consolidations bringing together firms representing various stages in chemical manufacture and horizontal mergers in which the competitors have combined in order to reduce cost in administration, sales and distribution. The DuPont-Grasselli merger in the heavy chemical field and the fusion of the Colgate, Palm-Olive and Peet Brothers enterprises in soap manufacture are typical of this important trend in the economic development of the chemical industry.

TECHNICAL PROGRESS

Research.—Equally important advances have been made in technology as the results of the ever-increasing volume of research being carried on in the laboratories of the industries and of the universities. A survey made under the direction of the National Research Council showed that $200,000,000 was being spent annually in the United States for scientific and industrial research. In chemical industry the survey revealed that 80 per cent of the companies sponsor research either in their own laboratories, in universities or through cooperative arrangements within their trade associations. The average expenditure reported for these chemical industries was $105,000 a year for each company, representing 2.4 per cent of the invested capital. In the dye industry alone the total outlay for research amounted to $2,584,908 in 1927, and it is reported that 1402 chemists and technically trained men were employed in the industry's laboratories.

Annual Survey.—The results of much of this research have been catalogued in the third annual Survey of American Chemistry, prepared under the auspices of the Division of Chemistry and Chemical Technology of the National Research Council. Some of these results, particularly those indicaitng major trends in industrial development, are briefly reviewed in the following paragraphs.

UTILIZATION OF AGRICULTURAL WASTES

Cornstalks for Paper.—The chemist and the chemical engineer have lately taken a hand in the solution of the farm problem. George M. Rommel, after a nation-wide inquiry for the U. S. Department of Agriculture, made the statement that "The chemical engineer has it within his power to transform farm crop waste of today into a billion and one-half dollars of added income for American farmers." There is no immediate prospect of such a realization but within the year some notable progress was made. At Danville, Ill., one company has spent approximately a half million dollars in an attempt to utilize

the cellulose from cornstalks as a chemical raw material for the manufacture of parchment paper. More than 10,000 tons of cornstalk were harvested from the 1927 crop and a completely equipped paper pulp plant capable of processing 100 tons per day of cornstalks has been in operation. A special edition of a book describing Mr. Rommel's survey was published in December, 1928, on paper that had been made from cornstalk pulp produced in the Danville plant.

"Maizewood."—At Iowa State College at Ames, Prof. O. R. Sweeney, of the Chemical Engineering Department, has had the coöperation of the United States Bureau of Standards in the building of a $75,000 semi-commercial plant for the experimental production of wall board and insulating lumber from cornstalks. A factory producing this product known as "Maizewood" has been in commercial operation at Dubuque, Ia. The research of Professor Sweeney, an international authority in this field, has also demonstrated the possibility of the chemical utilization of corncobs, straw and other cellulose wastes of the farm. One gets an idea of the commercial potentiality of such utilization when it is recalled that the cottonseed, which was once discarded as a waste, now yields an annual return of $200,000,000 in oil, feed cake and fertilizer. In other words, the chemist has added approximately $10 per bale to the value of the cotton crop.

Alpha Cellulose.—Last year the rayon industry used about 30,000 tons of alpha cellulose from wood pulp and 18,780 tons from cotton linters, yet according to a recent estimate more than 20,000,000 tons are annually available from the corn fields of the Middle West, while cottonseed hulls represent an additional 750,000 tons. Chemists freely predict that the next great era in chemical industry will be the age of cellulose. Certainly this country has an abundant source of raw material for such a development.

NITROGEN FIXATION

Nitrogen Production in U. S.—Marked advance was made during the year in the progress of the American air-nitrogen industry toward complete independence of foreign sources of nitrogen. In fact, if the by-product industry is included, this country is already equipped to supply more than twice the U. S. Ordnance Department's estimate of our military requirement for nitrogen. Our by-product coke ovens, according to C. J. Ramsburg, vice-president of the Koppers Company, can produce 168,500 tons of nitrogen per year. The synthetic ammonia plants have an annual capacity of 58,000 tons, and with the Muscle Shoals cyanamide plant of 40,000 tons, the total is 266,500 tons as compared with the estimated war requirement of 144,000 tons. Of the air-nitrogen plants, the largest is that at Hopewell, Va., which is still under construction but which on Jan. 1, 1929, had a capacity of 30,000 tons of nitrogen a year. The plants at Syracuse, N. Y., and at Belle, W. Va., each had a capacity of 12,000 tons and a fourth plant (at Niagara Falls) can produce at the rate of approximately 4,000 tons of nitrogen per year.

Supply Sources.—The apparent consumption of fixed nitrogen in 1928 in the United States was 432,800 tons as against 317,900 tons for the year 1927. Of the former quantity 190,000 tons were imported as Chilean nitrate and 91,500 tons in other nitrogen compounds, principally concentrated products made in the large German air-nitrogen plants. In recent years these plants have introduced a number of new synthetic fertilizer materials such as the "nitrophoska" series that contain the three essential plant foods, viz., nitrogen, phosphorus and potash. There is good prospect that products similar to these will be produced and marketed in the United States during 1929.

RAYON

Output and Plants.—As the new synthetic fiber industry begins to approach maturity, there have been some remarkable developments, both economic and technical in character. It is estimated on the authority of *Textile World* that the domestic out-

put of rayon in 1928 amounted to 98,650,000 lbs.—an increase during the year of 23,600,000 lbs. or 30 per cent. Several new plants and extensions to old ones are under construction so it is expected that the output will be further increased during 1929 to 129,200,000 lbs.

Producing Processes.—Of the four processes of making rayon, the viscose method still holds its dominant position, accounting for more than 80 per cent of the entire output. It is significant, however, that within the year, two of the country's largest viscose producers have turned to the acetate process to represent a part of their manufacture. The acetate product is admittedly superior in strength and has other qualities that have made it popular despite a greater cost.

Technical developments within the rayon industry have been in the direction of increased strength and improved appearance for the product. Addition of metallic salts or certain organic compounds to the usual coagulating baths has given better a "feel" to the product, while studies of the preparation and precipitation of xanthate have enhanced the strength of the viscose product. Improvement in appearance has resulted in the so-called "delustered rayon" in which a modification of the surface of the fiber has reduced the typical metallic sheen of rayon to the more subdued glint of the natural silk. Other trends indicate that, through the application of colloidal chemical principles, the next few years will likely see developments that will materially reduce the cost, and time of processing and handling. Thus the man-made fiber promises still further advance over its natural competitor.

DYES AND ORGANIC CHEMICALS

Important trends are becoming increasingly evident in the American dye industry. These are best revealed by the statistics of the United States Tariff Commission for 1927, made available in November, 1928. (1) Production continues to mount, increasing in 1927 to 95,167,905 lbs., a gain of 8.2 per cent over 1926. (2) The steady decline in domestic prices which began in 1917, when the average was $1.26 per lb., has continued in recent years as follows: 1921, 83 cents; 1922, 60 cents; 1925, 47 cents; 1926, 42 cents; and 1927, 39 cents. What this has meant to the textile and other consuming industries is indicated by the fact that the 1927 sales at 1921 prices would have totaled $81,621,539 instead of the actual figure of $38,532,795. (3) Increasingly severe competition has had the effect of reducing the total number of dye manufacturers. The 52 producers who accounted for the production in 1927 represented a decrease of 17 since 1925, and 38 since 1919. Perhaps three-fourths of the total output of dyes is concentrated in the hands of less than a half dozen firms. (4) Continued expansion in the domestic production of vat dyes and others of the newer types of superior fastness was noted in 1927. Vat dyes other than indigo increased 48 per cent over 1926 which in turn was 54 per cent above the preceding year. Thus the domestic industry has become practically independent of the foreign producer and the imports of 4,233,046 lbs. in 1927 were overbalanced by exports of 26,770,560 lbs.

Synthetic Products.—Among the synthetic organic chemicals showing most recent progress were the rubber accelerators, flotation agents and the aliphatic compounds such as ethylene glycol and other derivatives of ethyline. The total production of all synthetic organic chemicals of non-coal tar origin was 280,902,825 lbs. in 1927, of which 201,548,089 lbs. were sold for $36,600,628.

HEAVY CHEMICAL INDUSTRIES

Chlorine and Caustic Soda.—The largest peace-time plant for the electrolytic production of chlorine and caustic soda has reached full scale production of approximately 90 tons of chlorine per day. This plant, located in Charleston, W. Va., an increasingly important center of chemical industry, is situated immediately adjoining a fast growing organic chemical industry that consumes both of its products which are pumped to the plant in semi-finished condition.

Sulphuric acid manufacture, one of the oldest chemical industries, has received increasing attention in recent years. Platinum, for many years the standard catalyst of contact acid manufacture, threatens to be replaced by vanadium catalysts at a considerable saving to the industry. Sodium nitrate, as a source of nitrogen oxide for use in the chamber process, is fast being replaced by ammonia oxidation. Two types of small oxidation units for using anhydrous and aqua ammonia have been developed for sulphuric acid plants. In addition a number of large-scale ammonia oxidation plants have been built for the manufacture of nitric acid for the explosives and dye industries. This progress has been made possible largely through the development and fabrication of high chromium steels as corrosion-resistant materials of construction.

MARKETS AND FOREIGN TRADE

Prices.—With the growing tendency toward distribution of chemicals on long term contracts, price fluctuations are held within a narrow range. The weighted index number of *Chemical & Metallurgical Engineering* indicated a higher average price for 1928 which was largely traceable to the improved position of sulphur and sulphuric acid.

Imports and Exports Increase.—Foreign trade in chemicals and related compounds has expanded in both the outgoing and incoming movements. For the ten months ended October 31, 1928, imports of chemicals and related products amounted to $121,405,468 in value as compared with $109,956,945 for the same period in 1927. The gain in exports was less marked—increasing from $110,147,760 for ten months of 1927 to $114,040,421 for ten months of 1928. A slightly negative trade balance for chemicals should not be given an unfavorable interpretation, however, for imports have been largely confined to raw materials for chemical manufacture or to finished products of a non-competitive character.

PHYSICS

By Karl K. Darrow

Technical Staff, Bell Telephone Laboratories

SCATTERING OF LIGHT WITH CHANGE OF FREQUENCY

It now seems probable that 1928 will be remembered among physicists as the year in which the importance of scattering of light with change of frequency was for the first time properly realized. Scattering of light has, of course, been known for a long time. Tyndall studied it with liquids, whence it received the name "Tyndall effect"; the elder Rayleigh showed that it is the cause of the blue light of the sky; Cabannes and the younger Rayleigh observed it with gases in the laboratory. These and other researches established that free molecules and atoms individually scatter light—an important conclusion, for in dust-filled or smoke-filled gases or colloidal suspensions the scattering due to the suspended particles is so much greater than that due to individual molecules that the latter might easily be overlooked.

Scattering by molecules and atoms, however, is of fundamental importance. It was always more or less taken for granted that the scattered light is entirely of the same wave length as the primary light; but one may doubt whether there was ever a really thorough spectroscopic test of this doctrine. The only case in which scattered light was definitely known to differ in frequency from the primary light was that of the "Compton effect." High-frequency X-rays falling upon substances composed of light atoms are scattered, and a portion of the scattered rays—a portion which is relatively greater, the higher the frequency of the primary rays and the lighter the scattering element—

have a smaller frequency than the incident; these rays are said to be *shifted.*

"Shifted" Rays.—No indications of such a shift for rays of visible light had been detected before 1928, although there were predictions—one must mention in this connection the names of Smekal, Kramers, and Heisenberg—of which, in the light of present experience, it seems strange that nobody tried to verify them. The discovery was made by C. V. Raman, who irradiated benzene and other organic liquids with the light of the mercury arc, and examined the scattered light with a spectroscope. Its spectrum comprised not only the lines to be found in that of the primary light, but also a number of new lines companioning those. Special experiments showed that each bright line of the incident light was responsible for a particular group of new lines, mostly at frequencies lower than its own; and that the frequency-differences or "shifts" between a primary line and its companions were repeated without change from one to another of the primary lines.

CORPUSCULAR THEORY OF SHIFTED RAYS

Now according to the corpuscular or quantum theory of light, change of frequency means change of energy; if the frequency of a light-quantum diminishes when it rebounds from a molecule, it must have lost energy in the impact, and it is most natural to suppose that this energy is taken up by the molecule. This language, of course, implies that we are to consider scattering of light by molecules as the rebounding of quanta from molecules which they strike—a conception like that already introduced by Compton to account for the shift of frequency occurring when X-rays are scattered, for he assumed that the X-ray quanta—or some of them, at least—collide with free electrons and bounce off after the fashion in which elastic balls collide with and bounce off from one another. He had supposed that the energy lost by the quantum, whereof its change of frequency is the measure, is transferred to the electron and becomes kinetic energy of the latter.

We cannot employ identically the same picture to account for the Raman effect, since (for reasons connected with the principle of conservation of momentum) the maximum amount of energy which can be taken from the quantum *and used as kinetic energy of the molecule* is so small that the corresponding shift of frequency would be imperceptible. If, however, the energy taken over is used in *exciting* the molecule, there is no such limitation. We may then expect to find, associated with each primary line of frequency (say) n_0, a group of "shifted" lines having frequencies n_1, n_2, n_3 . . . , such that the corresponding energy-changes $h(n_0 - n_1)$, $h(n_0 - n_2)$, . . . just suffice to put the molecules of the scattering substance into their various excited states. Or, inversely: if we irradiate with light of frequency n_0 a substance composed of molecules susceptible of entering excited states, for which the energy-values are superior to the energy of the normal states by the amounts E_1, E_2, E_3 . . . , then we may expect in this way to find in the spectrum of the scattered light lines shifted toward lower frequencies from n_0 by the amounts E_1/h, E_2/h, E_3/h. . . .

This, it is evident, is the same statement for quanta as we have long been accustomed to making for electrons. An electron can spend part of its energy in exciting a molecule or an atom, or for that matter in ionizing an atom, or in conferring kinetic energy upon an atom, presumably also in conferring kinetic energy upon another electron, though it is difficult to conceive a way of proving this last statement. A quantum enjoys the same privilege. The electron, having spent part of its kinetic energy, becomes an electron of lower speed, and hence of greater wave length; for the electron has a wave length which increases as its speed diminishes. The quantum, having spent part of its energy, becomes a quantum of greater wave length, though of the same speed. The analogy, though not perfect, is far reaching.

CLASSIFICATION OF FREQUENCY-SHIFTS

This principle being admitted, the next step is to classify the various cases of scattering with frequency-change according to the manner in which the transferred energy is converted. In the effect observed by Compton, it becomes kinetic energy of translatory motion; in that observed by Raman, energy of intra-molecular vibration. From observations made by Rocard, Cabannes and Daure, and others, on the broadening of the unshifted and shifted lines, it appears that the transferred energy may be used in increasing the rotational speeds of molecules. It may also be used in exciting the vibrations of atoms and molecules incorporated in crystal lattices, these being the vibrations responsible for *Reststrahlen* or residual rays, which at least in some cases are controlled not by intra-atomic or intra-molecular forces, but by the forces which bind atoms together into a crystal. Scattering with change of frequency due to this cause was first observed by G. Landsberg and L. Mandelstam, almost at the same time as, and apparently independently of the discovery of Raman. Finally, scattering in which the scattered quanta have spent some of their energy in ionizing atoms and in giving kinetic energy to the freed electrons has been observed by W. Duane and G. L. Clark, and by B. Davis and D. P. Mitchell. These were X-ray, *i.e.*, high-frequency, quanta. The corresponding effect with quanta of visible or ultra-violet light, and the excitation of atoms accompanied by scattering with shift of frequency, have not yet been definitely identified; but unless some as yet unknown principle of selection inhibits them, they will probably be reported before long.

SHIFTED LINES WITH AUGMENTED FREQUENCY

An interesting feature of the Raman effect is the occurrence of "shifted" lines having higher frequencies than the primary light. These consist of quanta which have received energy from molecules which at the moment of the impact were in an excited state, whether because of prior absorption of energy from earlier-incident quanta or because of the statistical distribution of energy among the molecules in thermal equilibrium. They are more intense the warmer the scattering substance, because the proportion of molecules which at any instant are excited is greater, the higher the temperature.

Mapping Infra-Red Spectra.—An important by-product of these discoveries is the possibility of mapping infra-red spectra by observations in the visible or ultra-violet, *i.e.*, in the more convenient ranges of the spectrum. The frequency-difference between any primary line and any of its "shifted" lines should be the frequency of a spectrum-line of the scattering substance (though perhaps some of these predicted lines may never be spontaneously emitted); and in all the cases, thus far reported, these inferred spectrum-lines must lie in the infra-red, a region which has not as yet been thoroughly explored. Similarly, the effect observed by Clark, Duane, Davis, and Mitchell gives at least a theoretical possibility of determining the amounts of energy required to extract various electrons, even the loosely bound ones, from atoms.

Electron-Diffraction.—All these experiments on scattering of light accentuate the partial likeness of quanta to electrons. Inversely, the partial likeness of electrons to quanta is emphasized by the diffraction of electrons, demonstrated for the first time by Davisson and Germer in experiments described in the last previous issue of THE AMERICAN YEAR BOOK. Further experiments by the same scientists have shown that the waves "associated with" electrons, to use the current phrase—it would be better to say simply *electron-waves*, or *waves of negative electricity*—are not polarizable; at least, they are not to be polarized by the classic method of reflection or scattering, which avails with electromagnetic waves. It is remarkable that of the two known fundamental forms of wave-motion, one is polarizable after the fashion of transverse waves, while the other

simulates longitudinal waves in being incapable of polarization. The index of refraction of electron-waves in nickel has been studied as a function of wave length by Davisson and Germer.

Many other physicists have undertaken the study of electron-diffraction, notably G. P. Thomson, who, as early as the summer of 1927, obtained excellent photographs showing the diffraction of high-speed electrons by very thin polycrystalline films of various metals and at least one non-metallic substance (celluloid). Among others who should be mentioned are Rose, Szczeniewski, Nishikawa, Kikuchi, and Rupp, the last of whom announces that he has succeeded in diffracting electrons by an artificial ruled line-grating. The problem of diffracting atoms or ions has been attacked in several laboratories; Ellett and Olson report data which suggest that atom-nuclei are diffracted as if they were collections of protons each having the wave length appropriate, according to the theory of de Broglie, to a particle having the mass of the proton and the speed with which the nuclei are moving.

DIFFRACTION OF X-RAYS BY RULED GRATINGS

Mention of line-gratings recalls that the technique of using these to diffract X-rays has now been developed very far, notably by J. Thibaud and by pupils of A. H. Compton. The statement that "X-rays are of too small a wave length to be diffracted by optical gratings," although very often found in recent books and still occasionally made, is now entirely disproved. The technical difficulties are, of course, rather considerable, as the incident and diffracted beams must make very small angles with the metal surface in order that advantage may be taken of total reflection. One and the same line may be diffracted by an optical grating and by a crystal; the angle of diffraction with the former yields a value for the wave length of the line, depending on the directly measured spacing between the lines of the grating; then, measuring the angle of diffraction with the crystal and using the wave length just computed, one may calculate the spacing between the atom-planes of the crystal, and hence the number of atoms per unit mass and the mass of the individual atom. From these results, one may in turn deduce the value of the electron-charge, with an accuracy which promises soon to surpass even that attained in the famous measurements of Millikan.

High Voltages.—Attempts to produce voltages of the order of several millions, either by artificial generating-apparatus or by utilizing the atmospheric potential-gradients occurring in and near thunderstorms, are in progress at various places, and attempts also to develop tubes across which such voltages can be applied without destroying the vacuum within the tube, or indeed the tube itself; and much has been done to improve the technique of admitting high-speed electrons (with energies of several hundred thousand equivalent volts) to the open air through "windows" of very thin material—glass or metal—in the wall of the tube in which they are liberated and accelerated.

Millikan with Cameron has made additional measurements on the coefficients-of-absorption of the cosmic rays in matter, and from these has inferred their wave lengths, which permit the conclusion that these rays consist of quanta emitted when atom-nuclei of hydrogen or helium (supposedly wandering in interstellar space) coalesce to form atom-nuclei of the common moderately massive elements. Such processes would counterbalance the dissociation of massive atom-nuclei into nuclei of hydrogen and helium, which is supposed to take place on an enormous scale in the interiors of the stars. It should be noted, however, that all derivations of wave lengths from coefficients-of-absorption depend on formulæ based on one form or another of the new atomic theories, and extrapolated far beyond the range of possible verification.

THEORETICAL PHYSICS

The new theoretical physics presents the same spectacle as for the

past several years; new developments are numerous, extremely complicated, and baffling not only to the layman but to all except a few specialists among the physicists. Although both the matrix-mechanics of Heisenberg and the wave-mechanics of de Broglie and Schroedinger are accepted as definite steps in advance, the methods and the ideas of Dirac seem now to be regarded as the most promising. The theory of electrons in metals developed by Sommerfeld upon the basis of the statistical theories of Fermi and Dirac is well esteemed, although many of the phenomena of electricity in metals still remain unexplained. Houston, however, has succeeded in interpreting the proportionality of resistance to temperature, which was a stumbling-block to the old, and to Sommerfeld's first sketch of the new theory. The "indefiniteness principle" of Heisenberg, if it wins a permanent place, will undoubtedly figure as a remarkable novelty in philosophical thought. Gurney and Condon, and independently Gamow, have applied wave-mechanics to the problem of the atom-nucleus, producing a very interesting and suggestive picture of radioactivity and also presents an idea of the artificial disintegration of nuclei.

COGNATE SOCIETIES

American Microscopical Society.—Raleigh, N. C.

American Chemical Society.—1709 G. St., N. W., Washington, D. C.

American Electrochemical Society.—Columbia University, New York, N. Y.

American Leather Chemists' Association.—22 E. 16th St., New York, N. Y.

American Physical Society.—Columbia University, New York, N. Y.

American Society of Biological Chemists.—Columbia University, New York, N. Y.

Copper and Brass Research Association.—25 Broadway, New York, N. Y.

National Research Council.—29 W. 39th St., New York, N. Y.

Society of Chemical Industry.—Pratt Institute, Brooklyn, N. Y.

Synthetic Organic Chemical Manufacturers' Association.—1 Madison Ave., New York, N. Y.

DIVISION XXII
BIOLOGICAL SCIENCES

ORGANIC EVOLUTION

By G. Kingsley Noble

Curator of Experimental Biology, American Museum of Natural History

EXPOSITION

Organic Evolution is the process of change by which animals and plants, or parts of the same, arose from simpler types of organisms, or their parts. The "theory" of evolution is of ancient origin, dating back to the Greek philosophers and naturalists, particularly to Empedocles and Aristotle. Today evolution is no longer considered a theory but a fact, substantiated by a vast array of evidence which has been gained from direct observation of nature, as well as from abundant experimental data in the laboratory.

From the early part of the last century, the bulk of evidence from such diverse fields as palæontology, comparative anatomy, embryology, zoögeography has consistently and conclusively pointed to the fact that animals and plants are derived from simpler forms by changes in the germ plasm and are not produced by a special act of creation. A few naturalists have observed species in the field arising *de novo* from previously existing types. In the labratory it has been proved beyond doubt that mutations —or new types of animals and plants —may be produced experimentally by man. In England, Hyslop Harrison has recently induced melanism in moths by feeding the young with certain chemicals. Through the brilliant researches of Muller, Stadler, and Weinstein in America it has been shown that new types of fruit flies may result from the action of *x*-rays and radium. A very large part of the program of the genetics sections of the American Society of Zoölogists and of the Botanical Society of America, during the 1928 meeting in New York, was devoted to a discussion of experiments in this new field of man-made evolution.

THE MECHANISM OF EVOLUTION

Variations in Species. — Many names have been associated with the formulation of our present concept of the mechanism of evolution. Lamarck assumed that animals and plants as they developed were molded by their environment. He believed that these effects, produced during any one generation were inherited by the next. Darwin did not discard this assumption entirely, but advanced the idea that the directing principle of evolution was not the inheritance of acquired characters, but natural selection. He had observed that more animals and plants were produced each year than could possibly survive. Further he had noted that individuals of any one species vary enormously one from the other. He assumed that only those would survive which happened to be best fitted to live in a particular environment. In this way, sandy colored varieties would persist in the desert and green varieties in the tree tops. This selection by nature would control the direction in which evolution would continue. Darwin did not, however, know the underlying cause of the variation on which natural selection worked.

Laws of Heredity.—It has been the province of the recent science of genetics to analyze the nature of these varieties and the causes of their origin. The Austrian monk, Gregor Mendel, was the first to discover (1865) that once a mutation or "sport" arose in a stock, it was inherited by the following generation in a definite ratio, corersponding to the laws of chance working with freely assorting units. To Mendel's original laws, several other laws of heredity have been added by Americans, chiefly by T. H. Morgan and his associates. It has now been definitely established by the combined researches of cytology and genetics that the hereditary units are located in the chromosomes,—structures which form the most conspicuous part of the cell nucleus and stain readily with basic dyes. The evidence is also very extensive that the hereditary units have a linear arrangement within the chromosomes. It has been assumed that these units, or "genes" as they are called, are catalysts. It is the change which takes place in the genes, either spontaneously or through the effect of an external agent, which produces the mutations or new varieties. Combinations of mutations finally produce new species. On the other hand, it is also known that pronounced changes in the number or arrangement of whole chromosomes—or their parts—may have a pronounced effect on heredity. Hence the exact method of evolution in one group may be different from that in another, but in either case it is due to changes in the chromatin material of the germ cells.

DEVELOPMENT OF MAN

Origin.—Evolution is often restricted to a discussion of man's origin and here, especially, the discoveries of recent years have added greatly to our knowledge. The world has had approximately its present geological aspect for over a billion years. Mammals evolved from the reptiles in early Tertiary times and palæontological discoveries show very clearly the steps of this transformation. Man is a mammal of the order of primates. This branch separated from other mammalian stocks approximately 60 or 70 million years ago. The primates in turn early divided into several branches which gave rise in one direction to Man and in another direction to the living apes. Man probably arose in Central Asia or Eastern Europe from 30 to 40,000,000 years ago. At this time the region was sparsely forested and with an increase in aridity man developed terrestrial habits and an erect posture. His hands, freed from locomotory functions, developed the power of fashioning tools. Those individuals, who by a chance mutation had better brains, learned how to provide clothing, shelter, and fire. Man, today, owing to his vastly greater power of memory, reflection, and inhibition than any lower animal, is far more independent of his environment and hence "higher" than any lower type.

Social Evolution.—In animal society the race is to the swift and the strong—and so among primitive men. Modern society, however, allows good, bad, and indifferent to mingle. Hence man has not evolved in recent times, or rather his evolution has been social rather than physical. He has produced many useful types of animals and plants, through a careful selection of the "sports" in his domestic stock. But with a seeming disregard for these same principles, he has made little or no effort to develop better stocks of mankind. He has, however, made his environment evolve into a much pleasanter living-place, and is thus far more comfortable than the Stone Age man.

Recent Discoveries.—The main steps in man's development are well represented by fossils, notably by Pithecanthropus of Java and by the Cro-Magnon and Neanderthal men of Europe. Among the most important discoveries of the year has been the finding in New Mexico of a small herd of an extinct species of bison killed by primitive men, whose spearheads were still associated with the fossilized skeletons. This makes it probable that man has existed in America since the close of the Ice

Age. This conclusion has also been reached by ethnologists who estimate that at least twenty-five thousand years must have elapsed in order to have given rise to the great diversity of language found among the Indians of the Americas.

EVOLUTION AND RELIGIOUS DOGMA

Today every scientific man of standing accepts evolution as a process of nature. While they on the one hand are consistently amassing proof for evolution, there has arisen on the other hand a movement to suppress this evidence. Tennessee, Mississippi, and Arkansas (November, 1928) have now passed laws forbidding the teaching of evolution in the public schools. The question is being agitated in many more states. It is regrettable that America, alone of all civilized nations, has thus by legislative action decreed that religious dogma shall strive to silence verifiable truth.

VERTEBRATE ZOOLOGY

By James E. Kindred

Professor, University of Virginia

ANATOMY

Circulatory System.—During the past year many contributions have been made to supplement our knowledge of this system. The lymphatic system of an elasmobranch fish, Scyllium canalicula, is described in detail by Hoyer. From comparisons of the lengths and diameters of the capillaries of the brain in elasmobranch fish and rats, Craigie suggests that during evolution of the circulatory system, the capillaries increased in length and decreased in diameter, thereby giving greater functional efficiency (*Jour. Comp. Neur. 46*). Voris finds that the arrangement of the arterial supply of the brain of the opossum differs markedly from the typical mammalian pattern. The erroneous idea that the internal carotid artery of the seal has a tortuous course is dispelled by the investigations of Carmel, who finds that it has a very direct course. Wislocki, from a study of the anatomy of the sloths, correlates their postures and muscular activity with conditions of the vascular plexuses of the extremities (*Jour. Morph. and Physiol. 46*).

Kampmeier, from a study of the development of the valves of the human thoracic duct, concludes that although many valves appear during development only those persist which lie in regions of considerable pressure from surrounding structures, particularly the aorta and esophagus. The circulation of the normal kidney is described by Moore, who finds no true anastomosing arcuate arteries or arteriolæ rectæ. Only rarely do the interlobular arteries end in glomeruli. A study of the number, shape, structure, and surface area of the glomeruli of the kidneys, in man and other mammals, shows that glomeruli are most numerous in adult man, fewer in children, and still less numerous in dogs, cats and rats, respectively (Vimptrup, *Am. Jour. Anat. 41*).

The manner in which blood vessels grow in a transparent chamber introduced into a rabbit's ear is described by Sandison (*idem.*). His method promises to afford an improved technique for the study of living tissues. Bensley and Vimptrup observed the actual contraction of Rouget cells on precapillaries of the frog's tongue, and by supravital staining demonstrated the presence of myofibrils in these cells. According to Kampmeier, hemopoietic foci are present in the wall of the fetal human thoracic duct and collections of red and white blood cells occur in the pockets of the valves of the duct (*Am. Jour. Anat. 42*). Charriper and Dawson observed amitotic division of erythrocytes in the salamander Necturus (*Anat. Rec. 39*). Dawson observed

also that after erythrocytes of Necturus have been kept in plasma for several days, amitosis, cytoplasmic segmentation and nuclear extrusions take place (*Am. Jour. Anat. 42*).

Sources of red and white blood cells in the pleura of newborn children have been described by Kampmeier (*Anat. Rec. 42*). A method for making accurate counts of living blood cells of the fowl is given by Blain. From a study of the hemal nodes of the white rat, guinea pig, and sheep, Macmillan concludes that there are two kinds of nodes which contain erythrocytes, those possessing a wholly hemal circulation (sheep), and those which are merely modified lymph nodes (rat, guinea pig) (*idem*). No hemopoiesis such as Jordan found in rabbit cervical nodes was observed. E. R. and E. L. Clark observed ingestion of erythrocytes by macrophages in capillaries of the tadpole's tail (*Am. Jour. Anat. 41*).

Nervous System.—Inukai finds that the Purkinje cells of the cerebellum of the white rat decrease in number with age (*Jour. Comp. Neur. 45*). According to Langworthy, pouch-young opossums exhibit complex reflex movements before any myelinated fibers are present in the nervous system. Windle and S. L. Clark report evidences of discontinuous synapses between nerve fibers in a number of vertebrates. From a study of the thoracic region of the human spinal cord, Craw concludes that the motor cells are not arranged in a uniform column, but show major and minor diminutions. The terminations of nerve fibers within sensory cells of lateral line organs of Necturus (salamander) are described by Charriper (*idem*). Lineback concludes that what is commonly known as "eyedness," or the tendency for one eye to be stronger than the other, probably is caused by actual structural differences between the two eyes.

Reproductive System. — Andersen finds that in the tubo-uterine junction of 25 mammals, two of the most common features are, a special smooth-muscle sphincter and a ring of villi forming a valve in the mucosa (*idem*). According to Brode, the rudiment of the right ovary in fowl is present in all stages of development from nine-days incubation to 18 months of age.

Endocrine Glands.—The development of the thymus gland of the cat has been studied by Dearth, who finds that the corpuscles of Hassall are derived from the epithelial syncytium of the thymus, the cells of which become hypertrophied and keratized; growth of corpuscles is accomplished by additions of adjacent reticulum to their peripheral layers. This view is sustained by Kingsbury who interprets the formation of Hassall's corpuscles as expressions of growth transformations in an epithelium modified by loss of surface relation and by marked reticulation (*Anat. Rec. 38*). These data contravene the interpretation of Jordan and Horsley, that the corpuscles are formed by occlusion of blood vessels and hypertrophy of endothelial cells (see AM. YEAR BOOK, 1927). Yocum and Huestis make comparisons of thyroid gland structure in two varieties of mouse (Peromyscus maniculatus), one of which lives in the desert and the other on the coast, in an attempt to correlate histologic differences with somatic heritable characteristics (*Anat. Rec. 39*). Uhlenuth and Karns from a study of the development of the thyroid gland in a salamander (Amblystoma maculatum) conclude that the number of follicles remains constant throughout life and that growth is effected by increase in size, but not in number of follicles. J. C. Donaldson, by measuring the relative volumes of the cortex and medulla of the adrenal gland of the white rat, finds that there is no change during pregnancy.

CYTOLOGY

Chromosomes.—League from a study of spermogenesis in the guinea pig reports that the chromosome number in the spermogonium is 62 plus or minus 2, with a possible sex-chromosome of the X-Y type (*Jour. Morph. and Physiol. 46*). Harman and Root describe the metamorphosis of the spermatids in the same animal. Swezy counts two chromosome numbers in the spermocytes of rats pro-

duced from a cross between albino and wild varieties. Some possess 42 diploid chromosomes and some 62, but both possess 21 and 31 haploid chromosomes. From a study of oocytes in the human ovary, Hoadely and Simons conclude that the somatic chromosomal number in man is 48.

Cytoplasm.—Covell and G. H. Scott observed that granules in nerve cells of white mice and young rabbits which, with neutral red in vitro stain red, are stained by osmic acid and silver, thus supporting the hypothesis that the Golgi apparatus of nerve cells is derived from neutral-red stainable granules. Wenchao Ma, from an investigation of the relationship of zymogen granules in the stomach and pancreatic cells of various mammals, concludes that these granules are produced in part by mitochondria, chromophile material, and Golgi apparatus, respectively (*Am. Jour. Anat. 41*). The contention that mitochondria increase during secretion and diminish by rest is also sustained by Ma.

EMBRYOLOGY

Germ Cells.—According to J. B. Goldsmith, primordial germ cells in fowl originate from the extra-embryonic blastoderm and reach the site of the future gonads via the blood stream. In contrast, the primordial germ cells of man have their origin in the germinative epithelium of the primitive gonad, according to Simkins (*Am. Jour. Anat. 41*). Of interest because of its rarity is an unfertilized ovum found in the oviduct of a monkey (Macacus rhesus), described by Edgar Allen. The ovum was in a zona pellucida and consisted of a yellowish yolk mass capped by a clear polar area which came to the top when the ovum was at rest. Since this observation four ova have been recovered from the oviducts of different women during operations. Humphrey describes ovulation, cleavage, and gastrulation of a salamander (Hemidactylium scutatum).

Embryos and Fetal Membranes.—In a paper replete with beautiful microphotographs, Hartman describes the breeding season, rate of intra-uterine and postnatal development of the opossum. He finds that there is a relatively short intra-uterine period of about 12 days, and a long marsupial pouch period of 90-100 days. The prenatal growth in swine has been studied by Warwick who reports a decrease in size of litters during pregnancy; degeneration of fetuses by crowding; and a correlation between size of fetuses and fetal-membranes. According to Ibsen, the gestation period of the guinea pig is about 68 days; too many fetuses *in utero* retard growth of some; and approximately the same number of fetuses is found in right as in left uterine horn. Danforth and de Aberle, from an examination of 500 pregnant mice, state that the embryos are distributed in the uterine horns in a mathematically random manner; and that the *corpora lutea* of pregnancy follow the same arrangement. A description of the anatomical features of three human embryos of 17-, 22-, and 23-somite stages, respectively, is given by Wen. Evidence in support of the conception that free martins in cattle are produced from females which early in development are modified by the sex hormone of a conjoined male twin is given by Bissonnette.

Histogenesis.—Spark and Dawson describe the time of appearance of centers of ossification in the fore and hind limbs of albino rats, with particular reference to differences between the sexes; the females are found to be in advance. Shaner describes the development of the muscular architecture of the pig's heart. From the study of stages of muscle cell differentiation in tumors from heart and skeletal muscle, Wolbach concludes that they represent the normal embryologic stages of muscle fiber histogenesis. Thus, he conceives the stages to be: first, multiplication of centrioles; second, centriole dispersion, and third, formation of myofibrils from cytoplasm between centrioles. The fibrillar material contracts to form the Z band, and the granules of centriole origin give rise to the anisotropic Q band (*Anat. Rec. 37*). The histogenesis of the skin of

the albino rat is described by Fraser, who finds that development of a 4-layered epidermis takes place during the last 4 days of the gestation period and hairs erupt at the second postnatal day.

Organogenesis.—The developmental history of the secondary subclavian artery of the chick is given by Bakst and Chafee (*idem*). The postnatal development of the lung of white mice has been studied by Willson and compared with postnatal stages of lung development in children. In both mice and children, new air sacs are added peripherally during development; in the mouse throughout life, in the child up to the age of seven.

EXPERIMENTAL

Tissue Transplantation. — Twitty finds that ciliated ectoderm, when transplanted from one amphibian to another, will reverse its beat through an arc of 180 degrees regardless of whether it is isolated or in contact with underlying or adjacent tissues (*Jour. Exp. Zoöl. 50*). The importance of these experiments inheres in the demonstration of the independence from deeply lying tissues of ciliary action. Stone, by a series of transplantation experiments in larval salamanders, has shown that transitory ectodermal structures which precede lateral line primordia are not necessary for the growth of the lateral line, since the latter grow through indifferent transplantated ectoderm as easily as through the normal differentiated ectoderm (*Jour. Comp. Neur. 45*).

Detwiler transplanted optic vesicle and nasal placodes of salamander embryos to the limb region and found that spinal nerves grew toward them, but did not join them. An inference is made that the placode transplants although exerting a general directing force on the nerve fibers, lack a specific factor necessary to produce union (*Jour. Exp. Zoöl. 51*). Helff finds that by transplanting the annular tympanic cartilage from the ear region to the back in amphibian embryos, the skin above and in contact with the annular cartilage develops into a tympanic membrane. Loss of the annular cartilage results in failure of tympanic membrane formation. From these experiments Helff suggests that the developing annular cartilage liberates a secretion which causes the skin to form a tympanic membrane.

Digestive Organs.—Higgins observed that the gall bladder of male and female gophers emptied after a meal of 7 cc. of egg yolk and cream, but in pregnant females under the same feeding no gall bladder action occurred. Gall bladder stasis is not, however, according to Higgins, due entirely to the mechanical changes produced by pregnancy, but unknown chemical factors are involved also.

Endocrine Glands.—The effect on remote parts of the body of a substance resident in the anterior lobe of the hypophysis cerebra has been demonstrated by several investigators. B. M. Allen reports that adult frog hypophysis transplants will produce growth in hypophysectomized tadpoles, but have no effect on thyroidectomized tadpoles of the same species. When hypophysis is grafted into rats from which one ovary has been removed the remaining ovary grows to twice the weight of the normal ovary. Edgar Allen finds that puberty in monkeys can be brought on precociously by the transplantation in certain amounts of anterior lobe of hypophysis of the same species. Snyder obtains a melanophore-expanding and uterus-stimulating substance from the hypophysis of 30 mm. pig embryos. Corey reports that pregnant cats from which both adrenal glands have been removed do not survive any longer than do male and non-pregnant cats. This reaction differs from that in dogs, wherein double adrenalectomized pregnant dogs survived for the duration of pregnancy.

Excretory System.—From experiments with indigo-carmine and phenol red in the kidney of living frogs, Bensley and Steen conclude that the proximal convoluted tubules are secretory in function and the distal tubules resorptive.

Reproductive System.—Of significance are the results of Haterius on the relation between ovarian removal

and regeneration in mice. He concludes that ovarian tissue probably does not regenerate if the ovaries are completely removed, but if a slight bit is left, regeneration is very great. E. H. Herrick has found that in most cases of removal of ovaries from pregnant guinea pigs, abortion followed; but if ovaries from virgin females were transplanted into such animals, abortion was prevented (*Anat. Rec. 39*). Following mutilation of the ovaries of fowl, some laid more eggs and some laid less than normal (Steggerda).

R. K. Burns shows that the sex of larval salamanders is not reversed by transplants of gonads of the opposite sex. Pommerenke finds that the sera and vaginal secretions of rabbits in which repeated intravenous and intraperitoneal injections of rabbit sperms were made are toxic to rabbit sperm; the life of the sperm in the genital tract is shorter; the estrous cycle is not disturbed, but abortion sometimes results; and an infertility lasting from 4 to 25 weeks may result. Continuing his studies on reproduction, C. R. Moore finds that sperms live longer in the epididymis of rats and guinea pigs from which the associated testis is removed if the other testis remains in situ.

INVERTEBRATE ZOOLOGY

By S. F. Light

Associate Professor, University of California

PUBLICATIONS

Trends.—A survey of American literature on invertebrate zoology in 1928 indicates an increasing trend towards emphasis on the dynamic. Especially noticeable is a decided increase in the number of essentially physiological studies of invertebrates in addition to the usual experimental, ecological and life history studies. This movement is fostered and concentrated by the new quarterly periodical *Physiological Zoology*, University of Chicago Press, edited by Prof. C. M. Child. A survey of the thirty-one articles in its first volume (1928) shows that no less than eighteen of these deal with invertebrate material, and at least fifteen of these with invertebrates other than the *protozoa*.

Monographs. — Five monographic works are among the outstanding contributions. Three of these furnish much needed systematic treatments of the type invaluable to the ecologist and experimentalist. They are: (1) C. A. Kofoid, Tage Skogsberg and Josephine R. Michener, "The Dinophysoidæ of the Eastern Tropical Pacific," *Memoirs of the Museum of Comparative Zoology*, Harvard University Press; (2) W. K. Fisher, "Asteroidea of the North Pacific and Adjacent Waters." Part 2. Forcipulata (Part). *Bulletin 76*, United States National Museum; (3) James G. Needham, W. Frost and Beatrice H. Tathill, *Leaf Mining Insects* (Baltimore: The Williams and Wilkins Company, 1928).

Prof. Kofoid's splendidly illustrated monograph on the *Dinophysoidæ*, the luminescent, cellulose-producing protozoans of the open seas, is the second of three volumes on the *Dinoflagellata*, representing the fruition of many years of study centering around the rich collections of the albatross in the Eastern Tropical Pacific and involving a revision of the whole group.

Dr. Fisher's treatise on the forcipulate starfish of the North Pacific is the second in a completely illustrated monographic series designed to put the classification of the starfish of this region on a sound basis.

Dr. Needham's remarkable volume on leaf mining insects presents a most illuminating introduction to this fascinating field of biology with complete, fully illustrated accounts of the insects themselves and their remarkable adaptations to this habit of life,

as well as material designed for the specialist.

The report of the San Francisco Bay Marine Piling Commission, edited by C. L. Hill and C. A. Kofoid (University of California Press), is a remarkable example of effective results from cooperation between the scientist and the industries. Here, in a well got up, splendidly illustrated volume, is the history of attacks on marine wooden structures by animal organisms, molluscs and crustaceans, and especially *teredo;* the results of studies of their structure, life history, physiology and ecology, the results of investigation and experiment as to methods of prevention, and a summary of the economic findings as the end result of the focussing on the one problem of the minds of biologists, chemists and engineers.

Dr. Wm. M. Wheeler's splendidly illustrated, scholarly and interesting treatise on *The Social Insects: Their Origin and Evolution* (New York: Harcourt Brace & Co.) is an enlarged edition of the Harvard exchange lectures delivered at the University of Paris in 1925 and published in French in 1926. In 1927 the Prix Dollfus was conferred on the work by the Société Entomologique de France.

PROTOZOA

Life Cycle.—As a result of an extensive comparative study of the division rates of three ciliates, J. A. Dawson (*Jour. Exp. Zoöl.*, Vol. 51, No. 2), using pedigree isolation-culture methods and identical media over a period of four years and two months, believes the existence of "life cycles" to be disproved for these organisms. G. N. Calkins and R. Bowling (*Biol. Bull.*, Vol. 55, No. 2) in the first of a series of studies on the ciliate, *dallasia frontata*, describe, in addition to typical conjugation, the fusion of pædogamous isomicrogametes and suggest that endomixis in ciliates generally may be "a reminiscence of an ancestral gamete brood." Laura Garnjobst (*Physiol. Zoology*, Vol. 1, No. 4) describes encystment in *euplotes taylori* sp. nov. accompanied by a dedifferentiation of external organelles and probably nuclear reorganization. Encystment and excystment were induced at will by gradually drying up the medium and by the addition of a new culture medium, respectively.

H. B. Yocom (*Biol. Bull.*, Vol. 54, No. 5) again attacks the problem of the effect of quantity of culture medium on division rate, using *oxytricha* as a culture animal. He finds that the division rate is higher in smaller amounts of culture medium and believes, as Robertson has suggested, that this is due to concentration of an autocatalytic product of the organisms. In a profusely illustrated paper, R. G. Manwell (*Biol. Bull.*, Vol. 54, No. 5) presents the cytology of conjugation, division and encystment in *pleurotrichia*. He finds the endosome to divide in mitosis and to give rise to an intradesmose, as has been reported heretofore only for *paramecium trichium*. Marie A. Hinricks (*Physiol. Zoology*, Vol. 1, No. 3) in a study of the effect of ultraviolet radiation upon the division rate of *paramecium caudatum*, finds that division is depressed or inhibited by large doses and hastened by small doses. By successively arresting divisions, "permanent chains" of as many as four cells were produced which behave as single individuals. The suggestion is made that some such process may have had to do with the evolution of multicellular organisms.

Metabolism. — Numerous experiments on protozoan metabolism illustrate the increasing trend in the direction of the physiological attack. C. D. Beers (*Jour. Exp. Zool.*, Vol. 51, No. 4) shows that feeding *didinium* in pure line on starved paramecia results in greatly decreased fission rates which are restored to normal on resumption of a diet of normal paramecia, a result which he attributes to dietary insufficiency. He points out that many so-called rhythms in fission rate are probably due to dietary or other cultural factors. F. E. Emery (*Jour. Morph.*, Vol. 45, No. 2) presents results of an extensive investigation of the metabolism of amino-acids by *paramecium caudatum*. The rate of metabolism for fourteen isolated amino-acids was studied. Con-

siderable differences in the rates of utilization of the different acids were noted. A direct correlation was noted between rate of utilization of any acid and ammonia production. The influence of bacteria was found to be negligible.

Evolution and Heredity.—Studies in evolution and heredity using *protozoa* as subjects continue to produce interesting results. C. F. de Garis finds (*Jour. Exp. Zool.*, Vol. 50, No. 1) that continued selection of anterior and posterior daughter individuals brings out heritable diversities in pure lines of *paramecium caudatum*. R. C. Parker (*Jour. Exp. Zool.*, Vol. 49, No. 2) reports extensive studies on the effects of selection in various *infusoria* which indicate that such selection is effective only in organisms which undergo an endomictic nuclear reorganization and most strikingly so when selection is synchronous with the period of this reorganization.

METAZOA

Morphology and Development.—One of the most interesting contributions of the year is the description by Harold Heath (*Jour. Morph.*, Vol. 45, No. 1) of a free-living marine organism, *graffizoon lobatum* gen. et sp. nov., with all the external characters of a Müller's larva but with mature sex organs. This find raises controversies, quiescent for several decades, as to the phylogenetic significance of larval stages. Are we dealing here with a case of pædogenesis or with the persistence of a free-living ancestral form? Libbie H. Hyman (*Biol. Bull.*, Vol. 54, No. 1) gives directions for culturing *hydra* and presents extensive and important observations on budding, sexual reproduction, polarity, etc. Doris Edna Foles (*Biol. Bull.*, Vol. 54, No. 6) finds the two simple eyes of the adult barnacle to arise by splitting of the median eye of the cypris larva. R. J. Main (*Biol. Bull.*, Vol. 55, No. 2) reports a new and interesting feeding mechanism and the use of the excretory pore as an anus for the ctenophore, *mnemiopsis leidyi*.

Cytology.—H. J. Fry (*Biol. Bull.*, Vol. 54, No. 5), in an investigation which exemplifies the much needed, newer, controlled and quantitative method in cytological study, shows that the central body of artificially activated *echinarachnius* eggs has a *de novo* origin, and that it probably has no existence as an individualized body in the living cytaster. Josephine W. McNab (*Jour. Morph.*, Vol. 45, No. 1) in a study of the chromosomes of grasshopper eggs in meiosis, fertilization and cleavage, made possible by a new technique, finds further evidence for chromosome continuity in the retention of boundaries by individual chromosomes throughout interkinesis.

Physiology.—In an interesting article on color changes in *palæmonetes*, E. B. Perkins (*Jour. Exp. Zool.*, Vol. 50, No. 1) shows that light is effective in producing change only by meditation of the eye, that there is no histological evidence of enervation of chromatophores, that removal of one eye causes no effect, that removal of both causes lasting expansion, that arterial occlusion results in cessation of contraction, that on release contraction recurs, that extract of eyestalks injected into the blinded animal causes contraction and for these reasons, he believes the control in *palæmonetes* to be entirely by endocrines, the eyes producing an endocrine causing contraction.

Polarity and Regeneration.—C. M. Child, in two articles (*Biol. Bull.*, Vol. 54, No. 1), continues his experimental studies on polarity in *corymorpha*. In one, he deals with experimental transformations in bipolar reconstitutions, and in the second with the physiological polarity of the holdfast system. Child reports further (*Physiol. Zool.*, Vol. 1, No. 3) on the development of axes in the remarkable aggregations of cells of the stem of *corymorpha*, occurring after dissociation by grinding. *Planaria velata* undergoes a peculiar life cycle during which the internal organs undergo histolysis, the body breaks up and fragments of the body encyst and reform into young worms capable of repeating the cycle. The details of the two cycles and the factors controlling the onset of each are reported in an

interesting paper by W. A. Castle (*Jour. Exp. Zool.*, Vol. 51, No. 4).

Behavior.—J. P. Visscher (*Biol. Bull.*, Vol. 54, No. 4) shows barnacle larvæ to be negatively phototropic and not to attach at random but after testing out the surface, and Visscher and R. H. Luce (*idem*) show that green light is most effective and point out the probable economic importance of these findings in preventing or retarding "fouling" of ship bottoms by the use of green paint rather than the prevailing red paint.

Variation, Evolution, and Heredity.—*Drosophila* continues to hold the center of the stage in studies on heredity, the trend being in the direction of the experimental attack. R. R. Huestis (*Biol. Bull.*, Vol. 54, No. 2) presents a study of the effect of age in secondary non-disjunction and points out in summary that "the percentage of exceptions to sex-linkage may be affected by a number of variables which, in order of importance, are: the genetic constitution of the female, the temperature at which eggs are ripened, and maternal age."

H. S. Jennings and Ruth S. Lynch (*Jour. Exp. Zool.*, Vol. 5, No. 3) in the first of a series of studies on age, mortality, fertility and individual diversities in the rotifer, *proales sordida*, show that individuals of a clone are diverse in fecundity and in length of certain life periods, depending on the size of egg from which they arise and through this on the age of parents, and that an intrinsically uniform population must be from parents of the same age. In the second of the series (*Jour. Exp. Zool.*, Vol. 51, No. 3), it is shown that mortality is high in embryonic period for eggs from old parents and that otherwise the highest mortality is during the reproductive period, survival of which allows for an old age several times as long as the remainder of the cycle.

PARASITOLOGY

Two papers published during the year deal with the problem of the relation of the protozoan parasites of the anthropoid apes to those of man. J. F. Kessel (*Univ. Calif. Pub. Zool.*, Vol. 31, No. 13) lists thirteen intestinal protozoan parasites found in four species of monkeys of the genus *macacus*, indistinguishable from the species parasitic in man, and gives data from cultures and experimental infection which cause him to consider these species to be common to monkeys and man. Robert Hegner, in a general article (*Quart. Review Biol.*, Vol. 3, No. 2), shows the identity or similarity of the parasites of monkeys and man in general and points out the evolutionary significance of this relationship. H. L. Ratcliffe (*Am. Jour. Hyg.* 8, No. 6) finds that a high protein diet, as previously reported, is unfavorable to the multiplication of *trichomonas muris*, due to multiplication of the proteolytic anaërobes.

VERTEBRATE PALEONTOLOGY

By Frederic B. Loomis

Professor, Amherst College

Phases of Activity.—Activity in vertebrate paleontology, the science which deals with the history of those animals having a backbone, assumes four different phases: first, the discovery of new remains; second, the finding of more nearly or fully complete skeletons of those animals known previously only by fragments; third, the study of new and old material for its meanings, and lastly the presentation of such material to the general public either as museum exhibits, or in literature.

Bear Creek Field.—In the first field exploring parties, usually following up suggestions made incidentally by other kinds of field work, seek either new fields, or do intensive collecting in already known fields. A new field

was found in 1927 at Bear Creek, Mont., when the roof of the Eagle Coal Mine was found to contain numerous bones, partly those of sundry reptiles, such as turtles, crocodiles, and lizard-like champsosaurs, and, less abundantly, bones of early mammals. These have a peculiar interest in giving a picture of the life in a swampy area, whereas the Eocene of other localities represents the upland life. During the past summer this bed has been vigorously explored by the American Museum of New York, the Carnegie Museum, and Dr. Siegfriedt, the discoverer, for various other museums. Most of the animals are small insectivors, carnivors and primates.

Santa Rosa Elephants.—Another interesting new locality is the island of Santa Rosa, off California, which has come into view because of the finding on it the bones of a dwarfed elephant. This dwarfing of the elephant before its extinction, reminds us of a similar story of the elephants which were isolated on Cyprus and Malta when these land masses were separated from the mainland, and further suggests that Santa Rosa has not been isolated very long.

Three-Toed Horse.—Several museums have been doing intensive work on areas already known. An especially interesting find was that of a new three-toed horse in the Oligocene of the Big Bad Lands, a horse peculiar in an advanced dentition, but with notably short limbs. This was found by the Harvard Museum.

Mongolia and Argentina.—After a year of waiting for sufficiently settled conditions in the Chinese war, the American Museum renewed its collecting in Mongolia, and reports a very successful season, mentioning beside rhinoceros, and titanothere remains, the finding of a new mammal, larger than any heretofore known. The detail of their finds has not yet been reported as they are preparing the specimens in China before shipping them back to the museum. The great collection made by the Field Museum of Chicago is all shipped in and preparation of it is begun, some of the sloths from the Argentine Pleistocene being among the first things to be worked out. Reports on this collection will take some time, but will be speeded up as the study has been assigned in part to specialists outside the museum itself.

Collections in Various Fields.—Beside these major expeditions, the National Museum has collected dinosaurs from the Blackfeet Indian Reservation in Montana. Chicago University worked in the Oligocene and Miocene in Nebraska and Wyoming. Beside its horse Harvard found a camel skeleton in the Oligocene of South Dakota. The Carnegie Museum of Pittsburgh collected in the Eocene of western Colorado and Utah. Princeton University Museum had its party in the Big Horn Basin of Wyoming, adding a considerable list of new small mammals to those already known. The University of California found a skeleton of Aelurodon and the skull of a new hedgehog in the Lower Pliocene of Nevada, while their second party was collecting Permain reptiles in New Mexico. The Institute of Technology of California has developed a very promising quarry in the Lower Miocene near Bakersfield, California. Amherst College procured a new lot of unusually fine fossil footprints from the old locality at Turners Falls, Mass.

Museum Exhibits.—As fast as the finds of previous years have been worked out, the museums have been adding to their exhibits, among the notable new mounted skeletons being a giant tortoise from India, and a large Triceratops from western United States put on exhibition in the American Museum in New York. Harvard mounted skeletons of the early saber-toothed cat, Dinictis, and a Miocene oreodont, Mesoredon. Yale has a new plastic mount of the pair-horned rhinoceros Diceratherium, and the dinosaur Brontosaurus. Princeton shows the Eocene creodont, Paleonictis. Amherst mounted a skeleton of the Oligocene camel, Poebrotherium. One of the most striking new exhibits is that in the Denver Museum of a group of oreodonts, Merycochœrus, in which an adult male and female are set up standing, with

seven young skeletons at their feet in the matrix as they were found. They also have another early rhinoceros, Trilophodon.

Dinosaurs.—During the year The American Museum of Natural History opened its new dinosaur hall, in which is grouped the greatest collection of these monster reptiles to be seen anywhere in the world. The University of Michigan moved its large collection into a new museum building. The Field Museum of Chicago changed their lighting system so that now all the paleontological exhibits are lighted by electricity, instead of by window lights, thus placing all the specimens in favorable light at all times, an improvement also carried out to a large extent in the American Museum.

Early Man in America.—Perhaps the center of attention has been the question of early man in America. In that field the town of Folsom, New Mexico, has held the center of the stage with the American Museum, and the Denver Museum doing the active work. Here flint implements of a high grade of workmanship had been found the previous season in association with bison skeletons of an extinct type. The bison is now known as *Bison taylori*. Eleven more implements were found this season, and several of them were kept in place as found among the bison bones, until they were viewed by a large number of paleontologists and archeologists. The association is unquestioned and tends to establish the date as the last part of the glacial period or just after its retreat, perhaps 20,000 years ago. In this field also more worked bone and flint implements were collected associated with extinct forms in Florida. Here it was the National Museum that did the work.

Publications.—Many publications of a descriptive nature, or in details of larger problems have been published during the year, but here only those which are of a summary nature can be noted. From the National Museum has come a monograph of all the fossil lizards of North America by C. W. Gilmore. The same writer also gave us a description of the fossil footprints of Permian age from the Grand Canyon in the Smithsonian Miscellaneous Collections. Remington Kellogg completed a "History of the Whales," which came out in two sections in the *Quarterly Review of Biology*. G. G. Simpson had a series of a dozen or more papers on the Mesozoic Mammals in the *American Journal of Science*, studies in detail of those tiny little known predecessors of the living and typical mammals. A. S. Romer finished and reported on a study of the musculature of the pelvic region of ornithiscian dinosaurs in the Acta Zoölogica, and the same writer described restorations of the reptiles, Semouria and Dimetrodon in the *Journal of Geology*. H. Howard gave us a description of the fossil bird, Parapavo from the tar pits near Los Angeles, placing it between the peacocks and turkeys, in the University of California Publications. H. E. Wood reviewed the early Tertiary rhinoceroses in the *Bulletin of American Palæontology*, and W. K. Gregory and H. J. Cook presented a study of a series of Oligocene rhinoceroses in the *Proceedings* of the Denver Museum. W. J. Sinclair described a second of those gigantic flightless birds from the lower Eocene of Wyoming in the *Proceedings* of the American Philosophical Society.

For more general reading two books were published, *Creative Evolution*, the various chapters prepared by some seventeen specialists, and the whole edited by Frances Mason; and the *Syllabus of the Course in Vertebrate Palæontology at the University of California* by W. D. Matthew.

BOTANY

By J. M. Greenman

Missouri Botanical Garden, St. Louis

PROGRESS IN BOTANICAL SCIENCE

Practical Applications.—Progress in botanical science in 1928 has kept pace with the advance of previous years. Botany for botany's sake or science for the sake of science without reference to practical applications for the betterment of human welfare is no longer the sole aim and the ultimate goal of even the most orthodox.

Meeting of Botanical Societies.—The annual meeting of the American Association for the Advancement of Science, including the Botanical Section, together with the affiliated societies, notably the Botanical Society of America, the Phytopathological Society of America, the American Society of Plant Physiology, and the Ecological Society of America, was held in New York City during the Christmas holidays. Botanists from all parts of the country attended, and consideration was given to practically every phase of botanical investigation. It is noteworthy that among the hundreds of papers presented a very large number concerned matters of practical importance either directly or indirectly pertaining to the welfare of mankind.

MORPHOLOGY AND ANATOMY

Publications in the field of morphology and anatomy, as in previous years, have been confined chiefly to current periodicals. Indicative of the wide range of investigation in this field are the following: J. S. Karling in a series of articles, under the general title "Studies in the Chytridiales," published in the *American Journal of Botany*, contributes important information on the life histories of a group of small parasitic plant organisms. Sophia Papadopoulos in an article entitled "A Morphological Comparison of Leaflets of a Hybrid Cycad and the Two Parents" records that a hybrid between *Ceratozamia mexicana* and *Zamia monticola* "shows that some of the structures distinctly resemble either one parent or the other, and that other structures show characteristics of both parents." Mary Jones Fisher in "The Morphology and Anatomy of the Flowers of the Salicaeæ" records the results of continued study of the morphology and vascular anatomy of the flowers of *Salix* and *Populus* with the object of revealing additional evidence as to whether or not the Salicaeæ is a relatively primitive or comparatively advanced family. G. H. Smith, "Vascular Anatomy of the Ranalian Flowers II," has continued his investigations on the anatomy of the Ranales and finds that the "floral organization of these groups supports the view already expressed"; furthermore he states that "as regards the origin of the Menispermaceæ, Calycanthaceæ, and Anonaceæ, the vascular skeleton of each gives undoubted evidence of origin from the Ranunculaceæ."

A. J. Eames and Carl L. Wilson in "Carpel Morphology of the Cruciferæ" have added another important chapter contributing to our knowledge of the carpology of this interesting family. A paper entitled "Vascularization of the Node in Zea Mays" by Arthur T. Evans gives a method by which the complex nodal structure of the corn stem can be readily demonstrated and satisfactorily explained. Ophelia C. Wesley in an article entitled "Asexual Reproduction in Coleochæte" gives a detailed and lucid account of certain phases in the life history of *Coleochæte* with particular reference to the origin, development and escape of zoöspores and the formation of a second mature thallus. In a discussion under the title "Anatomy of Lycopodium Sporeling," E. A. Spessard confirms the view of Van Tieghem, Bower and others that the pith in *Lycopodium lucidulum* is stelar, not cortical, in origin. Dorothy G. Downie in an article entitled "Male Gametophyte of

Microcycas calocoma" adds an interesting and important chapter to our knowledge of the morphology and life history of a very conspicuous member of the Cycadaceæ. Of considerable interest is a paper by Miss J. G. Wright on "The Pit-closing Membrane in the Wood of the Lower Gymnosperms." Erlanson and Hermann have found perfect flowers in the poplar; the results of their study have been recorded in an article entitled "The Morphology and Cytology of perfect flowers in Populus tremuloides Michx." The plant found appeared to be normal except that it bore perfect flowers with a small proportion of female flowers and still fewer male flowers.

PLANT PHYSIOLOGY

Light Rays and X-Rays.—The study of the effect of light rays and *x*-rays on plants has continued to be an outstanding field of investigation. Johnson has presented a paper on "Growth and germination of sunflowers as influenced by *x*-rays." Eltinge has published the results of a study on "The effect of ultra-violet radiation upon higher plants." Other papers on the effect of light are those of Pfeiffer, "Anatomical study of plants grown under glasses transmitting light of various ranges of wave lengths" and "Microchemical and morphological studies of effect of light on plants"; Popp, "A physiological study of the effect of light of various ranges of wave length on the growth of plants"; and Bates and Roeser, "Light intensities required for growth of coniferous seedlings."

Experiments.—The work on the mosaic problem has been continued by many physiologists. Representative papers are those of Kraybill and Eckerson, "Tomato Mosaic"; Eckerson, "An Organism of Tomato Mosaic"; Purdy, "Attempt to Cultivate an Organism from Tomato Mosaic"; Purdy, "Multiplication of the Virus of Tobacco Mosaic in Detached Leaves"; and Holmes, "Cytological Study of the Intracellular Body Characteristic of Hippeastrum mosaic." An excellent summary of the study on virus diseases of plants has been given by Kunkel in Rivers, *Filterable Viruses.* The publication of Farr's very important and extensive study on the growth of root hairs in solutions has been continued with the papers on "The pH-molar-rate Relation for Calcium Chloride," "Root-hair Elongation as an Index of Root Development," "Structural Responses to toxic pH and Salt Concentrations," and "Further Investigations on Collards in Calcium Hydroxide." This work forms a very important contribution to our knowledge of the subject of growth. Eisenmanger has also made a contribution to this subject with the paper on "Toxicity, Additive Effects, and Antagonism of Salt Solutions as Indicated by Growth of Wheat Roots."

Denny and Stanton have presented several papers on the shortening of the rest period in certain plants. Germination studies have been made by Jones, "Overcoming Delayed Germination of Nelumbo Lutea"; Morinaga, "Effects on Germination of Water, Alternating Temperatures and Oxygen Supply"; Weiss, "Seed Germination in Gray Birch, Betula Populifolia"; Obga, "Work on Germination of Indian Lotus Fruits Both Century Old and Recently Harvested"; and Davies, "High Pressure and Seed Germination." Other contributions for the year 1928 which may be mentioned are Reid, "Growth of Seedlings in Relation to Composition of Seed"; Denny and Youden, "Acidification of Unbuffered Salt Solutions by Plant Tissue, in Relation to the Question of Tissue Isoelectric Points"; Deuber, "Mineral Nutrition and Chlorophyll Development in Seedlings"; Hafenrichter, "Respiration of the Soy Bean"; and Burge, Wickwire, Estes and Williams, "Stimulating Effect of Amino Acids on Sugar Metabolism of Plant and Animal Cells." Haas, Halma and Thomas have contributed studies on the physiology of the citrus. Raber has published a new text on plant physiology. The classic work of Willstätter and Stoll on chlorophyll has been translated into the English by Shertz and Merz; this translation will serve as a very valu-

able reference book for the student of plant physiology.

CYTOLOGY

Cytological research during the year 1928 has been along much the same special lines as of the past few years. Chromosome studies, especially, have been prominent as exemplified by the work of Wexelsen, "Chromosome Numbers and Morphology in Trifolium"; Hicks, "Chromosome Studies in the Cyperaceæ, with Special Reference to Scirpus"; McAllister, "Sex Ratio and Chromosomes in Riccia Curtisii"; Hollingshead, "Chromosomal Chimeras in Crepis"; and Belling, "A Method for the Study of Chromosomes in Pollen-mother Cells." Other types of cytological research are represented by the papers of Karling, "Nuclear and Cell Division in the Antheridial Filaments of the Characeæ"; Doubt, "Cytology of Halidrys Dioica"; and Bolenbaugh, "Microsporogenesis in Tropæolum Majus with Special Reference to the Cleavage Process in Tetrad Formation." Clausen has continued his studies in the field of genetics and cytology on "Interspecific Hybridization in Nicotiana."

ECOLOGY

Aggressive, coöperative, and effective work has continued among the ecologists. The number of papers published in this field has been relatively large and for the most part the papers are to be found in the journal *Ecology*. Of the many articles which have appeared the following are enumerated as indicating the scope and general excellence of the work done: "Studies of Plants in the Black Hills of South Dakota," by H. E. Hayward; "Littoral Vegetation on a Headland of Mount Desert Island, Maine," by D. S. Johnson and A. F. Skutch; "Seventeen Years of Successional Change upon Isle Royale, Lake Superior," by William S. Cooper; "Influence of Sphagnum and Other Mosses on Bog Reactions," by Herman Kurz; "The Rôle of Microörganisms in the Transformation of Organic Matter in Forest Soils," by S. A. Waksman, F. G. Tenney, and K. R. Stevens; "Persistence of Prairies," by H. C. Cowles; "An Ecological Study of Linné Bog, Cheboygan County, Michigan," by Doris Dean and Helen Coburn. N. E. Fassett has presented the results of a prolonged and careful study of "The Vegetation of Estuaries of Northeastern North America," a type of work of equal interest to the ecologist and taxonomist. Two papers by E. Lucy Braun are "The Vegetation of the Mineral Springs Region of Adams County, Ohio," and "Glacial and Post-Glacial Migrations Indicated by Relic Colonies of Southern Ohio." Of special interest are Ramaley's book, *Colorado Plant Life*, and Toumey's *Foundations of Silviculture upon an Ecological Basis*, both of which deal with the subject from a monographic point of view.

MYCOLOGY

Important contributions have been made during the year in the field of mycology, and for these *Mycologia* has been one of the main mediums of publication. Among the shorter articles published elsewhere than in *Mycologia* the following may be mentioned: "Concerning the Status of the Genus Laternea," by David H. Linder. The author restores *Laternea* Turpin to its original status and recognizes one species, *L. triscapa* Turpin. Vivian M. Pires in an article entitled "Concerning the Morphology of Microstroma and the Taxonomic Position of the Genus" presents substantial evidence for placing this fungus with the Basidiomycetes. W. B. McDougal has studied the "Mycorhizas from North Carolina and Eastern Tennessee" and concludes that "the fungus is a parasite on the root and derives food from it but that the root receives no benefit and may be injured by the relationship."

It is especially important that attention be called to some of the outstanding and more general works in this field, which have appeared during 1928. Among these are: *The Gasteromycetes of the Eastern United States*, by W. C. Coker and J. N. Couch; *Field Book of Common Gilled Mushrooms*, by William S. Thomas; *The North American Cup Fungi*, by

Fred Jay Seaver; and a translation by Carroll W. Dodge of Gaumann's *Vergleichende Morphologie der Pilze* (Jena, 1926). This English edition entitled *Comparative Morphology of Fungi* will be of interest and great value to the American student.

TAXONOMY

Explorations.—Botanical exploration during 1928 has been pursued in various parts of America with the same intensity as during the past few years. Collections in the larger herbaria of the country have been greatly amplified, particularly by additions of plants from tropical America. E. J. Palmer has continued his collecting and field studies of woody plants of the eastern United States for the Arnold Arboretum. Hitchcock has made a special study of the grasses of the eastern provinces of Canada. Brother Marie-Victorin has continued his critical botanical survey of the Province of Quebec. Mrs. Mexia has made extensive collections in the interior of Alaska, and Dr. Small has made further botanical explorations which have taken him into the Gulf States.

Publications.—Publications in this field again have been numerous and varied. The several centers where taxonomic work is emphasized have pursued definite plans of work with effective coöperation. The New York Botanical Garden has centered its activities largely in the West Indian region, the Southeastern United States, and the Rocky Mountain region; and at the same time pushing forward the publication of *The North American Flora*, of which Part 2 of Volume XXIII, *Mimosaceæ* (Cont.) by Britton and Rose has recently appeared; Rydberg has published the results of critical studies of the Fabaceæ; and Gleason has made notable contributions to our knowledge of the flora of northern South America. *Contributions from the Gray Herbarium* contain numerous papers, the results of critical studies, by the several members of the staff. "Records Preliminary to a General Treatment of the Eupatoriæ" by Robinson is another important contribution to our knowledge of the Compositæ. "Studies in the Boraginaceæ,—VII," by Johnston, is a valuable addition to the literature on this difficult family. "The Genus Oxytropis in Northeastern America" and "The North American Species of Anemone and Anemonanthea," by Fernald, and other papers by the same author are of particular interest. "Agalinis and Allies in North America—I," by Pennell, is a continuation of his monographic studies of the Scrophulariaceæ. *The Contributions from the United States National Herbarium* contains two important publications, namely, "Flora of the Panama Canal Zone," by Paul C. Standley, and "Costa Rican Mosses collected by Paul C. Standley in 1924-1926," by Edwin B. Bartram. "Studies in the Genus Bidens VIII, IX," by Sherff, is a continuation of the author's intensive work on this group.

Blake has published several shorter papers of interest including a "Review of the Genus Diplostephium"; and Maxon has made important contributions to our knowledge of the ferns. Munz in "Studies in Onagraceæ I" begins an important series of articles on this family; and Irene Poe has published "A Revision of the Plantago Patagonica Group of the United States and Canada." Babcock has continued his studies of the genus *Crepis* and published several new species from China. Hall has published a monographic study of "The Genus Haplopappus." *The Annals of the Missouri Botanical Garden* for 1928 contains the following taxonomic papers, "A New Genus of the Acanthaceæ" and "A Monograph of the American Species of the Genus Dyschoriste," by C. E. Kobuski; "Studies in the Umbelliferæ," by Mildred E. Mathias; "Concerning the Status of the Genus Laternea," by David H. Linder; "The Problem of Species in the Northern Blue Flags, Iris Versicolor L. and Iris Virginica L., by E. Anderson; "A New Variety of Vernonia Lindheimeri," by Ester Larsen; "Dysosma—A New Genus of Berberidaceæ" and "Studies in the Apocynaceæ II, III," by R. E. Woodson. Grout has published Volume 3,

Part 1, of the *Moss Flora of North America North of Mexico.*" Hylander's *The Algæ of Connecticut* is a noteworthy contribution and a useful book to the student of the algæ.

GENERAL PUBLICATIONS

Several textbooks, reference books, and other works of a general nature have appeared during the year. Swingle's "Textbook of Systematic Botany" and Adam's "A Bibliography of Canadian Plant Geography to the End of the Year 1920" should be mentioned. There has been a very decided movement in America and abroad to popularize science; and this movement has resulted in a rather voluminous non-technical literature which may be exemplified by the following citations: *Flowers of Coast and Sierra* with thirty-two plates in color, by Mrs. Clements; *A Guide to the Trees*, by C. C. Curtis; *Common Wild Flowers of Pennsylvania*, by E. M. Gress; *Pioneers of Plant Study*, by E. Hawks; *A History of Garden Art*, edited by W. P. Wright, translated from the German by Mrs. Archer Hind; *The Home Garden Handbook*, by F. F. Rockwell; *A Guide to the Wild Flowers*, by N. Taylor; *Plant Life and its Romance*, by F. E. Weiss; *Pleasures and Problems of a Rock Garden*, by Louise Bebe Wilder; *Plant Hunting* and *More Aristocrats of the Garden*, by Ernest H. Wilson.

ECONOMIC BOTANY

By H. K. Hayes

Professor, University of Minnesota

COOPERATION IN SEED IMPROVEMENT

The Seed Council of North America was organized in 1927. It is composed of representatives of organizations interested in the seed program of this country. The organizations are: International Crop Improvement Association; American Society of Agronomy; Official Seed Analysts of North America; Commercial Seed Analysts of North America; National Association of Commissioners of Agriculture, Bureau of Plant Industry, Bureau of Agricultural Economics, Office of Cooperative Extension Work, American Seed Trade, and Farm Seed Association of North America. Seed adaptation and seed legislation are among the important general problems which have received consideration. The national association is aiding the formation of state seed councils by giving information to those interested as to the plans, purposes, and advantages of seed councils.

"Better Wheat" Conference.—A conference of farmers, millers, extension specialists and research workers was held at Fargo, North Dakota, March 27, 1928. The purpose was to discuss the possibilities of a cooperative attack on the problem of breeding disease-resistant varieties of hard red spring wheat. Short addresses were made with particular reference to the feasibility and possibility of obtaining satisfactory commercial varieties of wheat which were resistant to all of the more important diseases. While it was recognized that the problem was a difficult one, the reports of progress already obtained furnished evidence for the general belief that disease-resistant varieties which excel in agronomic qualities could be obtained, providing the problem could be carried on a sufficiently extensive and scientific basis.

The members in attendance, from Montana, North Dakota, South Dakota, Minnesota, and the U. S. Department of Agriculture, decided to hold an annual conference and to join forces. In the words of Dr. C. R. Ball of the Office of Cereal Crops and Diseases, the purpose of the problem "is to produce better wheats." A research program was agreed upon and a permanent organization was formed.

A similar meeting in the interests of all phases of the production of hard red winter wheats has been arranged in Kansas early in November. The plan calls for coöperation between the five important hard-red-winter-wheat-producing states: Oklahoma, Kansas, Nebraska, Texas, and Colorado.

A sweet corn breeding conference of men from the various parts of the United States was held in Wisconsin in September to discuss problems in relation to the sweet corn canning industry. The purpose in this case was to exchange ideas and discuss the most recent information available regarding methods. The selection of the best possible inbred lines and the yearly production of first generation crossed seed was considered the most promising method of producing seed for canning purposes. Hybrid corn of this nature has been given much publicity by the farm press throughout the country.

The importance of the problem of seed and varietal improvement emphasizes the necessity of a coöperative attack on the problem. The use of good seed and the control of noxious weeds are two of the most important phases of Economic Botany.

Symposium on Seed Improvement.—The subject of seed improvement of farm crops was discussed as one phase of the annual meeting of the American Society of Agronomy held in Chicago, November, 1927. Kisselbach (*Jour. Amer. Soc. Agronomy, 20, 1-14 1928*) presented the viewpoint of the Agricultural Experiment Station worker. Methods of obtaining new varieties by the Experiment Station were outlined and the large total increases in yield, obtained by the use of improved varieties, were emphasized. The registration of new varieties of crops by the American Society of Agronomy, based upon performance, was discussed and it was pointed out that 48 varieties of wheat, oats, or barley were registered in 1926. It is hoped to register varieties of other crop plants when such registration appears desirable.

In this connection it is of interest to note (see *Jour. Amer. Soc. Agron., 20, 1928*) that registration of soybean varieties on a basis of merit has been arranged. Rather (*Jour. Amer. Soc. Agron., 20:15-22, 1928*) discussed the Michigan plan of the multiplication of seed of new varieties by an organization of farmers such as the Michigan Crop Improvement Association. Only such seed as will pass certain requirements of quality and purity can be certified and receive the approval of the organization. Twenty states have similar organizations and these are banded together in an International Crop Improvement Association. Such national programs are one means of developing a stable and permanent agriculture. Kellogg (*Jour. Amer. Soc. Agron., 20:23-35, 1928*) emphasized the growing menace of the weed problem and stressed the necessity of a joint attack on weed control.

DISEASE RESISTANCE

Crop Varieties.—The production and use of disease-resistant varieties of crops are now employed extensively as an important means of overcoming the losses resulting from plant diseases when susceptible varieties are grown. Pathogenic diseases frequently consist of physiologic forms which can be differentiated only by the manner of reaction on particular varieties or strains of the crop in question. This makes the problem of obtaining disease-resistant varieties a more complex one, since varieties which are resistant to one physiologic form of a disease may be severely infected by another form. The importance of the physiologic races of a disease are emphasized in a recent paper by Gaines (*Phytopathology, 18:579-588, 1928*), who reports that wheats which, in previous years, were practically smut-immune were severely infected in another crop season, presumably because a new physiologic form of smut had appeared. In spite of these difficulties, Gaines states: "The most hopeful point of attack to meet this new situation is a greatly increased program of breeding for resistance to the new forms."

That resistance to disease is of major interest is indicated by the

fact that one of the invitation papers presented at the eighth annual convention of the Canadian Society of Technical Agriculturists, held in Quebec, was on this subject. Garber (*Scientific Agriculture, 9: 103-115, 1928*) summarized some of the more recent viewpoints regarding disease resistance in plants and presented certain of his own studies in West Virginia which have as their purpose the obtaining of both corn and oat varieties which are immune from smut. The data given indicate that the problem in West Virginia can be solved by the use of disease-resistant varieties.

Bacterial wilt is of economic importance on popular varieties of sweet corn. Reddy and Holbert (*Jour. Agr. Res., 36: 905-910, 1928*) emphasize the fact that, although the disease has been known for over thirty years, no method of seed treatment or other control measures have materially reduced losses. Tests of pure line strains of dent corn showed that the progenies of some lines were uniformly highly resistant. This appears sufficient reason for the belief that resistant sweet corn varieties could be produced by breeding.

EXPERIMENT AND DISCOVERY

Thornless Blackberries. — The thorns on blackberries and dewberries add greatly to the discomfort of picking the fruit. There is reason to hope that thornless varieties adapted to various regions will be evolved gradually. Butterfield (*Jour. Heredity, 9: 135-137, 1928*) records the history of three groups of thornless seedlings. The Cory thornless blackberry was obtained originally from tip cuttings of the variety known as Mammoth. Root cuttings give only thorny plants. This led Darrow (*Jour. Heredity, 19: 138 142, 1928*) to conclude that the Cory thornless was a "chimera." Buds grown from root cuttings develop only from inner tissue while buds from tip cuttings grow from the outer tissue. A thornless dewberry is believed to have originated as a sport from the Austin variety. It reproduces thornless types. Both the Cory and Austin thornless varieties yield well in the regions to which they are adapted but are severely injured by winter killing when grown in regions where the winters are more severe. The third group, the Burbank thornless, is believed by Darrow to be a seedling of a thornless garden form. Darrow points out the value of these thornless varieties as breeding stock for the production of thornless varieties for those regions where winter killing is more severe.

A study made by Crane and Darlington (*Genetica, 9: 241-278, 1927*) suggests some of the difficulties in breeding thornless blackberries. They state that the possibilities of crossing species of *Rubus* are evidently determined, to a great extent, by chromosome numbers. Polyploid forms are composed, as a rule, of homologous sets of seven chromosomes, the total chromosome complement depending upon the number of such sets. They suggest that the new evidence presented by them supports the view that the loganberry is an immediate result of the raspberry-blackberry cross.

Influence of Pollen in the Date Palm.—Nixon (*Jour. Agr. Res., 36: 97-128, 1928; Jour. Heredity, 19: 241-256, 1928*) has given the results of several years' experiments which prove the immediate effect of the pollen used upon the size of fruit and seed of the date palm. The most striking effect of pollen was a difference in the time of ripening of the fruit which, in some cases, was as much as ten days. The practical value of this discovery will consist of the use of the right sort of pollen as an aid to cultural practices in the production of high grade standardized fruit. Nixon states that "the data suggest an interrelation, heretofore unrecognized, between the embryo and the tissues outside. Swingle (*Jour. Heredity, 19: 257-267, 1928*) proposes the term "metaxenia" for this effect and suggests that the embryo or endosperm, or both, secrete hormones, or soluble substances analogous to these, which diffuse into the tissues of the mother plants in the seed and fruit and there exert a specific effect

depending upon the particular pollen parent used.

Experimental Production of Species.—Karpechenko (*Zeit. ind. Abs. and Vererb., 48, 1928*) has studied the problem of experimental species formation in hybrids of *Raphanus sativus L.* with *Brassica oleracea L.* These radish and cabbage hybrids are considered to establish experimentally the theory of the hybrid origin of polyploid species, i.e., those with higher chromosome numbers but with multiples of a basic number. Both parental species contained 18 diploid chromosomes and the F_1 likewise contained 18. There was no conjugation of chromosomes in the prophase of reduction division and sexual cells were formed which contained haploid, diploid, and tetraploid chromosome numbers. Tetraploid plants, produced by the union of gametes containing a diploid number, bred true and resembled the plants of the F_1 generation. Karpechenko reviews considerable of the literature of this interesting field and states: "The experimental conquest of the multiplication process of the chromosome complex in plants ought to reveal to us new great possibilities in plant breeding work."

Inducing Mutations by X-Rays and Radium.—Any attempt to induce mutations by external agencies is of interest both from the scientific and practical standpoints. A report by Stadler (*Science N. S., 68: 186-187, 1928*) of mutations in barley induced by x-rays and radium confirms similar discoveries with the fruit fly. Stadler's treatments were applied to germinating seeds and the induced mutations recorded affected the progeny of only part of a plant. The barley plant consists of several tillers from axillary buds, each tiller terminating in an inflorescence of about 30 self-fertilizing flowers. The cells from which the tillers will be developed are already differentiated in the dormant embryo of the seed. A mutation occurring in only one of these cells will affect only one tiller. Fourteen segregating mutant seedling characters were observed in a total of 1243 head progenies treated with x-rays while three mutant seedling characters were observed in 1039 head progenies which were treated with radium. In 1341 untreated progenies, no mutations were observed. The mutations appeared to be the result of a change in a single genetic factor.

ENTOMOLOGY

By E. Porter Felt

Chief Entomologist, Bartlett Tree Research Laboratories

SOCIETIES AND MEETINGS

The Fourth International Congress of Entomology held sessions at Cornell University, Ithaca, August 12th to 18th. Attendance exceeded all preceding congresses, although the first to be held in America. There were 38 nations represented by delegates and 625 persons registered, of which 134 were from foreign countries. Dr. L. O. Howard was president and Dr. O. A. Johannsen, American executive secretary. Two attending octogenarians, Dr. W. J. Holland of the Carnegie Museum, Pittsburg, and Dr. S. A. Forbes of the Illinois Natural History Survey, were elected honorary members. This gathering was the outstanding entomological event of the year.

The American Association of Economic Entomologists held its 40th annual meeting at Nashville, Tenn., December 27 to 30, 1927, with some 250 in attendance. Prof. W. D. Herms of California was elected president and C. W. Collins of Massachusetts, secretary-treasurer. The 13th annual meeting of the Pacific Slope branch was held at Pomona College, Claremont, Cal., June 14-15; W. S. Woglum, chairman. O. H. Swezey of Honolulu was elected chairman and R. E. Campbell, secretary.

The Entomological Society of America held its 22nd annual meeting at Nashville, Tenn., December 27-28, 1927. Prof. E. O. Essig of California was elected president and Prof. J. J. Davis of Indiana, secretary. Prof. H. T. Fernald of Massachusetts gave the annual address.

Personnel.—There was bestowed upon Dr. L. O. Howard, late chief of the U. S. Bureau of Entomology, the rank of Officier de la Legion d'Honneur, a promotion from the rank of Chevalier of the Legion, an honor he received five years earlier. Dr. E. P. Felt, State Entomologist of New York for some 30 years, retired from public service and is now Director and Chief Entomologist of the Bartlett Tree Research Laboratories, Stamford, Conn. Dr. R. D. Glasgow, of the University of Illinois, was appointed State Entomologist of the State of New York.

INSECT QUARANTINE AND CONTROL

Administrative Changes. — The work of the Bureau of Entomology and the Federal Horticultural Board has been reorganized, the former restricting itself to research and the latter, now designated as the Plant Quarantine and Control Administration, is responsible for plant quarantines and the control and prevention of spread of plant diseases. There are eight administrative units as follows: Foreign Plant Quarantines, Dr. E. R. Sasscer, in charge; Domestic Plant Quarantines, Dr. S. B. Fracker; European Corn Borer, L. H. Worthley; Pink Boll Worm and Thurberia Weevil, G. G. Becker; Moths, A. F. Burgess; Japanese Beetle, C. H. Hadley; Mexican Fruit Worm, P. A. Hoidale, and Date Scale, B. L. Boyden.

Plant Quarantine Amendment.—Additional authority to enforce quarantines has been given by an important amendment to the plant quarantine act which authorizes agents of the department, when they have reason to believe that articles are moving in violation of any of the Federal plant quarantines or restrictive orders, to stop and without warrant to inspect, search, and examine persons, vehicles, receptacles, boats, ships or vessels, and to seize, destroy, or otherwise dispose of articles found to be moving, or to have moved in interstate commerce or to have been brought into the United States in violation of any quarantine order promulgated under the plant quarantine act.

Japanese Beetle. — Considerable spread has occurred, the insect being found in widely separated New England localities, such as New Haven, Hartford, and New London, Conn.; Springfield, Mass.; Lewiston, Marysville, Sayre, Pa., and Alexandria, Va.; Sussex and Kent Counties, Delaware, are also infested. It is probable that rigorous control or eradicative measures will be enforced in the case of infestations remote from the generally infested areas rather than extend the general quarantine to include such localities. The treatment of the soil with poisons or a carbon disulphide emulsion, attracting the insects to baited traps and the efficiency of community control have all proved valuable control measures.

Other Asiatic Beetles.—There is a strong sentiment in some quarters in favor of placing similar quarantines upon three related, though less destructive and relatively little known, Asiatic beetles; namely the Asiatic beetle, *anomala orientalis*, *aserica castanea* and *serica similis*, all introduced and which have come to notice largely on account of the injury caused by the grubs to lawns and golf greens. Spraying or dusting lawns with an arsenical poison has given excellent results in destroying grubs or beetles of the first two of these insects.

Mexican Fruit Worm.—This dangerous pest has apparently been eradicated from the lower Rio Grande Valley of Texas, accomplished by the destruction during the summer of 1927 of all susceptible ripe and ripening fruit throughout the two counties infested, thus starving the insects from June to September, supplemented by continuous inspection of local citrus groves and fruit, followed by another starvation period during the spring and summer of 1928.

Gipsy Moth.—The Quebec quarantine has been lifted due to the successful extermination of an isolated colony. This removes a serious barrier to the importation of Christmas trees. The New England area, designated as generally infested, has been enlarged to include 50 towns in Vermont, Massachusetts and Connecticut. They were designated before as lightly infested. The insects are becoming abundant in the territory between the Connecticut River and the Barrier Zone, thus threatening the integrity of the latter unless vigorous repressive measures are put into effect shortly. It is not improbable that the decreased activity of parasites, in 1924 and subsequently, has been reflected in more general defoliation of forest areas in eastern New England and a stronger drift westward. Most of the infestations in the barrier zone occurred in southwestern Massachusetts, northwestern Connecticut and in various places of the adjacent areas in New York State.

Satin Moth.—This insect has appeared for the first time in Vermont, although the most extensive spread has occurred in Connecticut and New Hampshire, and less in Maine and Massachusetts. The quarantine has been extended in Maine, New Hampshire, Massachusetts and Connecticut to include a total of 172 towns or 5116 square miles.

European Corn Borer.—The Fourth International Conference on this insect was held September 27-28, at Toledo, Ohio, and Monroe, Mich. There has been, as was to be expected, an extension of the infested area. These new areas will probably be put under regulation early in the year. Intensive control methods upon the periphery of the infested section is being pressed vigorously. The promotion of agricultural methods unfavorable to the European corn borer, especially the low cutting made possible by modified harvesters and the deep plowing under of all corn débris, are being stressed as the most practical methods of control.

Mexican Bean Beetle.—There has been a great extension of the infested territory. The insect has entered the northeastern corner of Indiana, invaded Michigan and advanced approximately two tiers of counties in New York State. It has been found in Rockland and Orange counties, N. Y., has been reported from the greater part of New Jersey and Delaware, and has reached the coast in North Carolina. There has been an extensive and unexpected movement into the coastal areas of New Jersey, Maryland and Virginia.

Cotton Pink Bollworm.—This insect, which had been eradicated from extensive areas of eastern Texas and Louisiana, was discovered in December, 1927, to have been reintroduced into the main cotton belt; namely, the Western extension of continuous cotton culture in west-central Texas, the area infested including nearly 400,000 acres of cotton. State and Federal quarantines were promptly extended to cover the region and preliminary eradication measures instituted. The most effective eradication method is a non-cotton zone, the growers formerly being recompensed from Federal and state funds. Owing to the fact that Texas was unable to provide its share of funds, Congress passed a joint resolution authorizing full compensation from Federal funds to cover growers' actual and necessary losses due to the prohibition of the growth of cotton in such zones.

INSECTICIDES

Codling Moth Problem.—The necessity for repeated applications of poisons to control the codling moth in different sections of the country resulted in heavy and late sprayings with a consequent accumulation of poison upon the surface of the fruit. This led to a tolerance limit upon the amount of arsenic which might be present upon fruit offered for sale and necessitated thorough and costly washings to eliminate the excess. The Federal Bureau of Chemistry, as a result of this situation, has been searching for a poison deadly to moths, harmless to humans and one that will not require a wash or other treatment before the fruit can be marketed. It has developed neonicotine, obtained from crude dipyridyl, a compound

more deadly to insects than nicotine. This Bureau has also made available a commercial supply of the mixture of ethylene dichloride with carban tetrachloride, a new and valuable fumigant.

Pyrethrum Soap Sprays.—Recent work shows that pyrethrum soap sprays are gaining favor for the control of insects on ornamentals. These sprays appear to be more efficient and more pleasant to use than the earlier combinations. The presence of about five per cent of soap in a contact spray increases its efficiency.

APICULTURE

Meetings.—International coöperation in scientific apiculture was greatly strengthened during the year by three important meetings; namely, the Apiculture section of the International Congress of Entomology at Ithaca, N. Y., the Apis Club at Geneva and Bern, Switzerland, in August, and the 8th International Congress of Apiculture at Turin, Italy, in September. All were well attended by authorities in beekeeping from many countries. They will be combined in connection with the International Congress of Entomology to be held in Paris in 1932.

Equipment and Research.—Important advances in equipment have been made with especial attention to rapidity of work. More attention has been given to a study of honey than heretofore, with especial work on enzymes and vitamins in this food. Further studies of biometrics have appeared in Russia, and important improvements have been made in the technique of artificial insemination by L. R. Watson.

COLLECTIONS AND TEXT

Baker Collection.—The important C. F. Baker collection of insects, consisting of some 300,000 specimens of Malayan forms and a card index of some 100,000 entries has been successfully transferred to the United States National Museum. This is a particularly valuable collection because it was made in a section where the insect fauna is relatively little known.

The C. W. Johnson collection of true flies or *diptera*, comprising some 6,000 species, has become the property of the Museum of Comparative Zoology, Cambridge, Mass. The considerable amount of material from Java and South America adds much to the value of the collection.

The Howard Lee Clark collection of moths and butterflies, consisting of some 1100 species, 586 of them owlet moths or *noctuids*, has been transferred to the custody of the Boston Society of Natural History, Boston, Mass.

Elementary Texts.—Among elementary texts may be listed: *Elementary Lessons on Insects* by James G. Needham, Charles C. Thomas Publishing Company; *A Popular Guide to the Study of Insects* by E. P. Felt, a handbook of the New York State Museum; *Common Garden Pests* by C. T. Gregory and J. J. Davis, published by Better Homes and Gardens.

College Texts.—More technical works of college grade are: *The Biology of Insects* by George H. Carpenter, Macmillan; *Destructive and Useful Insects, Their Habits and Control* by C. L. Metcalf and W. P. Flint, McGraw-Hill Book Company; *Spraying, Dusting, and Fumigation of Plants* by A. Freeman Mason, Macmillan, and *A Manual of External Parasites* by H. E. Ewing, Charles G. Thomas Company.

Other Publications.—The social and philosophic phases of insect life are represented by: *The Social Insects* by W. M. Wheeler (12 lectures delivered as Harvard exchange Professor at the University of Paris), Harcourt Brace & Company; *The Foibles of Insects and Man* by W. M. Wheeler, Knopf; *The Social World of Ants* by Auguste Forel, translated by C. K. Ogden, two volumes, Putnam; *Leaf Mining Insects* by James G. Needham, Stuart W. Frost and Beatrice H. Tothill, Williams and Wilkins. There are two important works on Apiculture; *Beekeeping* by E. F. Phillips, Macmillan, a revised edition, and *Modern Beekeeping* by Herbert Mace. The special and technical are represented by *Mosquitoes of the Americas* by H. G. Dyar, Carnegie Institution (really a supplement to the four volumes on

mosquitoes published earlier under the same auspices); *A Handbook of the Dragon Flies of North America* by James G. Needham and Hortense B. Haywood, Charles G. Thomas Publishing Company; *Empididæ* by A. L. Melander, the last being fascicle 185 of *genera insectorum* and consisting mostly of tcehnical keys and lists of species.

MISCELLANEOUS

Seventeen Year Locust.—The appearance in the eastern United States of a large brood of the noisy periodical cicada, frequently termed the seventeen year locust, was of very general interest. The insects caused considerable apprehension, although as a rule they cannot be considered serious pests.

Preserving Replicas.—A German chemist, it is announced, has discovered that insects covered with finely powdered copper oxid and then heated in a platinum crucible in an atmosphere of carbon dioxide become metallized. It is suggested that the process may be utilized to secure imperishable replicas of delicate specimens.

NECROLOGY

Frederick L. Washburn, formerly State Entomologist of Minnesota, died October 15, 1927. Charles W. Howard, Professor of Biology in Canton Christian College (Lingnan University), an American by birth, education and extensive experience, died in March in Wheaton, Ill. Dr. E. A. Schwarz, an international authority on beetles or *coleoptera*, died at Washington in November. J. Ritzema Bos, an Entomologist of international standing, died April 6-7 at Wagenigen, Holland.

COGNATE SOCIETIES

American Anthropological Society.—45 W. 45th St., New York, N. Y.

American Association of Museums.—2 W. 46th St., New York, N. Y.

American Entomological Society.—1900 Race St., Philadelphia, Pa.

American Nature Association.——Lakewood, N. J.

American Nature Study Society.—542 Arden Place, Toledo, O.

American Ornithologists' Union.—1939 Biltmore St., N. W., Washington, D. C.

American Society of Naturalists.—University of Pennsylvania, Philadelphia, Pa.

American Society of Zoologists.—University of Minnesota, Minneapolis, Minn.

Botanical Society of America.—Cornell University, Ithaca, N. Y.

National Association of Audubon Societies.—1974 Broadway, New York, N. Y.

New York Microscopical Society.—American Museum of Natural History, New York, N. Y.

New York Zoological Society.—101 Park Ave., New York, N. Y.

Paleontological Society of America.—American Museum of Natural History, New York, N. Y.

Reptile Study Society of America, Inc.—108 Convent Ave., New York, N. Y.

Zoological Society.—101 Park Avenue, New York, N. Y.

DIVISION XXIII
MEDICAL SCIENCES

PHYSIOLOGY

By Percy G. Stiles
Harvard University Medical School

SENSORY NERVES

The Basis of Sensation.—This is the title of a small but authoritative and suggestive book by a distinguished English physiologist (Adrian). Until very recently much more study has been devoted to the functioning of motor nerves than to that of sensory nerves. Now we have data which throw light on the mode of action of the latter. For some years it has been the accepted teaching that the impulses passing along fibers of various classes are themselves essentially of one kind. It follows that the varying effects produced by such impulses must be referred to the different destinations to which they are led. One other possibility has to be reckoned with: evidence of the importance of frequency and grouping of successive impulses. This is the central theme in Adrian's discussion.

Advance in Technique with Radio.—The passage of impulses along nerves can be detected by delicate electrical apparatus. Physiologists have been aided in these investigations by the contrivances used in the field of the radio. A technique has been developed that is adequate to register the activities of single nerve-fibers. This represents a great advance in refinement of method and it is already fruitful. Not only have the recording instruments been given this incredible sensitiveness, but preparations of living tissue have been made in which it is certain that only one sensory unit is preserved. Thus, for the first time, it is possible to learn something of what happens when such a unit is subjected to stimuli of varying strength.

In brief, the statement may be made that increasing the strength of the stimulus applied to a receptive ending increases the frequency of the sensory impulses which travel up the connected fiber. The simplest cases are those in which a bit of muscle is pulled upon by varying weights. There is found to be a correspondence between the magnitude of the weight suspended and the number of impulses per second detected in transit. The maximum frequency is in this instance about 100 per second. The limit is set, not by the nature of the nerve-fiber which can convey many more impulses than this, but by the properties of the receptor organ which recovers less quickly than does the nerve after each excitation.

Sensory Adaptation.—When a stimulus, such as a weight, acts for some time the frequency of the resulting impulses diminishes. This is said to be an example of adaptation. It is more marked for certain sensory mechanisms than for others. It is a familiar fact that we soon cease to feel contacts with the skin; for example, those of hat and spectacles. Laboratory proof is now furnished that when a nerve-ending in the skin is pressed upon the flow of impulses toward the center rapidly flags. On the contrary the failure of stimulation is much more gradual when muscle is kept under a constant tension. If equilibrium of posture is to be maintained the impulses of this class must not cease.

Adrian's Work.—If we attempt to summarize the chief implications of Adrian's work the following statements may be ventured. The intensity of sensation may depend on three variables: the number of fibers brought into action, the frequency of the succession of impulses, and the duration of the process. Extremely brief stimulation may fail to develop sensation to a maximum; with more prolonged excitation the maximum is reached and followed by the phenomenon of adaptation; with the electrical technique we come nearer than ever before to an objective measure of sensory experience.

DIGESTIVE ORGANS

Boldyreff on Periodic Activity.—Boldyreff at Battle Creek has continued in recent times to extend his observations of the state of the alimentary tract during fasting. He now reaffirms certain conclusions at which he arrived long ago but which have seemed to receive little consideration. He states that the canal has periods of marked motor activity and that the movements are attended by the discharge of secretions, notably of pancreatic juice. It is his belief that the service of such secretions is to be absorbed into the circulation and distributed to the tissues at large. By this means the distant cells are furnished with enzymes which may have originated in the pancreas. The suggestion is made that insulin, the pancreatic product which regulates the utilization of sugar, may first enter the intestine and then be taken back into the blood.

Boldyreff's generalization is to the following effect: The digestive system has a double service. When food is present in its lumen the organs bend their energies to its resolution into products suited for conveyance in the blood, the familiar conception. But when the tube is empty of food there is still a requisition of enzymes or similar agents. They are not in this case destined to perform their function within the canal, but to meet the needs of all the cells of the body as they carry on their metabolism.

WALKING AND CLIMBING

The Cost.—Reference may be made to a particularly well-organized study of this problem. The subjects were college women but it appears that sex has little influence on the findings. The expenditure involved in the various trials was deduced from the oxygen consumption as measured with a new type of portable equipment. The following are outstanding conclusions: To raise one's body-weight vertically through one meter calls for a sacrifice of reserves which would carry it 15 meters along a level path. The descent of a stairway proves to be an unexpectedly costly process: the combustion is about one-third of that accompanying the climb or 5 times that of horizontal progression.

CIRCULATION

"Stream Lines."—Attention has recently been called to a curious possibility with respect to the passage of blood through large vessels. The portal vein is a wide and rather short trunk which conducts blood from the digestive tract to the liver. One would naturally assume that the blood in such a channel would be thoroughly mixed. But evidence is now furnished that this is not the case. The portal vein receives a branch from the spleen. If a dye is injected into this branch in the living animal it is presently found localized in a particular part of the liver, the left lobe. If the tell-tale coloring matter is made to enter the principal vein draining the small intestine it becomes concentrated in the right half of the liver.

Such facts can only be accounted for on the assumption that the portal vein carries parallel streams or strands of current which have little tendency to mingle. A similar state of affairs may be seen below the junction of two rivers of water, one of which is clear and the other muddy. When the experiment described is carried out in the dark with a strong light shining through the portal vein the strand of deeply colored blood is seen as distinct from the rest. When the forks of the vein within the liver

are reached it is apparent that this component finds its way for the most part into certain branches rather than others.

LIGHT

Radiant Energy.—The physiological effects of light and other types of radiation constitute a subject which constantly occupies a larger place in scientific literature. Not long ago the photosyntheses of the plant world seemed to be the only processes of much significance depending upon radiant energy. But other instances of this potent factor at work are continually reported. The relation of light to vitamines and so to nutrition has proved to be a most important matter. A minor example of the influence of light on biological reactions may be cited.

Hæmatoporphyrin is a complex substance derived from the pigment of blood. It has been administered to animals of various kinds and the curious observation has been made that the result depends on whether or not they are afterward exposed to light. A dose harmless to an animal kept in the dark may be fatal if it is placed in the open. The toxic effect of the drug, depending as it does on the auxiliary influence of the light, is described as photodynamic. It is not the development of a poisonous property in the hæmatoporphyrin by itself; the light must act upon the living tissue and modify its reaction with the foreign substance.

EMOTIONAL BEHAVIOR

The Diencephalon.—In the mammalian brain there is a small subdivision called the diencephalon. It is just below the cerebrum and appears, superficially at least, to constitute a connecting link between this and the remainder of the nervous system. A very thorough investigation has recently been directed to this region with the object of discovering its significance. Cats deprived of the cerebrum but retaining the diencephalon have been compared with animals from which both structures have been removed. It turns out that the diencephalon, small as it is, has a distinct influence on the capacities of the organism.

A cat having the diencephalon intact presents at intervals all the familiar signs of intense emotional disturbance. In the absence of the cerebrum such excitement is considered to be unconscious and the manifestation is spoken of as "sham rage." When the signs of such excitement are enumerated it is found that most of them must be referred to a general activity of the so-called sympathetic system. The inference is encouraged that the diencephalon contains a governing mechanism for this part of the nervous equipment. Experiments of great precision have shown further that this control is a function of the ventral rather than the dorsal part of the body in question.

CUTANEOUS RESPIRATION

The question of the amount of respiratory exchange which can take place through the skin has often been raised. Among the lower vertebrates, as, for example, in the case of the frog, a considerable share of the gaseous exchanges may be carried on at the exposed surface. This can only be true where the skin is delicate and the animal small. As the mass of the body increases the surface area bears a diminishing ratio to the weight. It is plain that not much oxygen or carbon dioxide can be expected to penetrate the many layers of the human skin.

A study made upon the cat deserves to be reported. A determination of the oxygen absorbed by the skin of this animal has shown it to be about one-two-hundredth of that entering the system through the lungs. But the careful experimenter has made a further observation which must not be overlooked. He has shown that the oxygen which enters the skin does not pass through into the blood. It is used by the epithelial cells for respiratory purposes of their own. Similarly, the carbon dioxide which makes its appearance in the chamber containing the trunk and legs of the animal has not escaped from the circulating blood but is a product of the superficial cells. Cutaneous respira-

tion is, therefore, a local matter and not a part of the process in the body as a whole.

The fact is to be borne in mind that the cat has few sweat-glands. It has been noted with human subjects that the carbon dioxide discharged from the skin increases markedly when there is an outbreak of sweat. In this instance the extra gas has probably come from the blood below the impervious cell strata at the surface. Yet here again it may be a specific product of the cells which are secreting the sweat. We can see that a barrier between the blood and the atmosphere is needed. The normal characteristics of the blood are based upon its equilibrium with the air in the lungs which has a composition quite unlike that of the open air.

THE SPLEEN

Not many years ago the usefulness of this organ was wholly a mystery. Light was suddenly thrown upon the matter when it was shown that the spleen contracts greatly in times of stress and expresses a considerable reserve of blood corpuscles into the circulation. Furthermore it has been found that the normal, living spleen is much larger than the shrunken organ which is seen post mortem. Observations on its reactions have been made possible by a remarkable operation. This consists in bringing the spleen of the dog from its sheltered position in the abdominal cavity to a site on the surface of the body. The animal lives in health and comfort with the spleen subject to examination at any time.

If a dog thus treated runs up a long flight of stairs the spleen becomes much contracted. There is simultaneously a decided increase in the number of red corpuscles in the circulating blood. The demand of the muscles for more oxygen has been met in part by this addition to the cells which transport it. A late announcement from the British laboratory in which these facts have been noted adds another significant one. This is a shrinking of the maternal spleen during pregnancy followed by a return to the usual size after the birth of the young. The change appears to be just such as will insure an ample blood supply to meet peculiar requirements.

When the spleen is "externalized" it becomes available as an indicator of the action of drugs. Especial interest has centered about its sensitiveness to the adrenal principle and the observations appear decisive. When this preparation is introduced into the blood the spleen invariably contracts. It will be remembered that the secretion of the adrenal medulla has long been held to assist in the mobilization of an animal's resources for meeting an emergency. The recorded effect upon the spleen is consistent with such a conception since the result is to promote the supply of oxygen to the muscles and brain.

THE RESPIRATION OF NERVE

It is only about fifteen years since the first clear evidence was presented in support of the view that nerve-trunks discharge carbon dioxide as a feature of their activity. The scale of the metabolic process in nerves is a remarkably restricted one; they are distinguished by the extreme economy with which they function. But technical methods have been devised to make the delicate measurements involved and early criticism of such attempts has been silenced. It has been definitely proven that the transmission of nerve-impulses takes place at a definite cost to the fibers: not only is carbon dioxide set free while oxygen is consumed but heat production has been demonstrated.

A recent research has led to surprisingly clear-cut conclusions. The quantities of carbon dioxide liberated by nerves at rest and under stimulation are given with extreme precision. How strictly quantitative such estimates can become is illustrated by the following statement: A single impulse traversing one centimeter of a single fiber appears to do so at a cost of oxidation which produces 3,850,000 molecules of carbon dioxide. In many of its fields physiology now deserves to rank as an exact science.

PATHOLOGY

By A. J. Miller

Professor, University of Louisville

YELLOW FEVER

Studies.—Hudson reports studies on experimental yellow fever in macacus rhesus. The important lesions consisted of jaundice, hemorrhages into the serous membranes, mucous membranes, liver and kidneys, acute degeneration of the viscera, fatty degeneration of the liver, kidney, heart and spleen, necrosis of the liver and adrenals and a small amount of reaction on the part of the host. This work is of special importance since it includes detailed comparison of the tissue changes in the monkey and man. The bridging of this gap is important and sometimes very difficult. The lesions produced by the experimental infection of monkeys and the spontaneous infection of man are identical with a few minor exceptions. There was no evidence of the localization of the virus. No constant bacterial form was demonstrated.

RHEUMATIC FEVER

Occasionally, in medicine as well as in other sciences, explanations are given which grow out of general observations rather than scientific proof. This seems to have been the case with acute rheumatic fever. This disease has been described for some time as a streptococcic infection but the reproduction of the disease was difficult and denied by some. Belk, Jodzis and Fendrick have succeeded in isolating a streptococcus from the blood stream of patients suffering from rheumatic fever. These organisms were grown on artificial media in pure culture and injected into animals. Rabbits and horses were used both of which developed lesions in the heart and joints that were quite typical of rheumatic fever. In a number of instances the organisms were recovered from the blood of the experimental animals and used in other animals which developed the same lesions. Some of the lesions were very typical according to photographs. One important step is lacking, however. This consists of the finding of the organisms in the lesions produced. This may be explained by an unusually small form of the organism in the lesions. Evidence is growing which indicates that a number of bacteria have varied forms in different stages of a life cycle and that unusual forms are the result of certain environment.

TISSUES

Vitamin Deficiency.—The tissue changes which occur in the human as a result of vitamin deficiency and those in an omnivorous animal, the white rat, are now described also in a herbivorous animal, the guinea pig. The changes following a loss of fat soluble vitamin A are similar to those found in the rat and suggest, therefore, a specific pathological process. The important changes as described by Wolbach and Howe are emaciation, atrophy of the salivary glands and testes and extensive keratinization of the epithelium. Salivary glands contained nodules formed by distention of gland units with desquamated keratinized cells. Similar masses were found in the bronchi, uterus, bladder, vagina and prepuce, though here there were large masses of pasty material, consisting of the same type of cellular debris, distending the cavities. An explanation for the morbid processes is not as yet indicated.

Lung Tissue and Oils.—The reaction of lung tissue to different oils is again mentioned by Pinkerton. The simple neutral vegetable oils as, olive oil, poppy seed oil and sesame produce no reaction and appear to produce no injury. This is possibly explained by the fact that there are no enzymes capable of hydrolyzing or otherwise breaking it up into injurious substances. Mineral oil is emulsified, taken up by phagocytic cells and consolidation of the lung is produced

by the cellular infiltration. There is some fibrosis as an end result. Animal oils are very injurious probably because they are broken up into fatty acids which cause necrosis and a marked cellular reaction. Giant cells are formed and there is some similarity between these lesions and those of tuberculosis. It is suggested that the tubercles formed by the injection of dead tubercle bacilli or the ether extract of them are simply fat inflammations.

OBITUARY

Dr. James Homer Wright, Director of the Pathological Laboratory of the Massachusetts General Hospital and Assistant Professor of Pathology in Harvard University, died on January 3, 1928. He was 58 years old. He had a degree from Johns Hopkins University and the University of Maryland and an honorary degree from Harvard.

He contributed many laboratory methods that are in general use in bacteriology and pathology. One of the most important of these is the preparation and staining of blood films. He was co-author with Dr. Mallory of a book on *Pathological Technique.* He was the first to demonstrate the *treponema pallidum* in syphilitic lesions of the aorta. His description of actinomycosis is noted for its completeness and clearness. Perhaps his most important contribution was the description of the genesis of blood platelets. This work has not been enlarged on up to the present. His contributions are not only valuable for their originality but are classical because of their completeness, their conciseness and the clear language used. It is said of him: "He never found it necessary to retract a statement." This characterizes him as the great scientist and master of language which he was.

Dr. Hideyo Noguchi.—In May, 1928, yellow fever claimed the life of a noted bacteriologist, Dr. Hideyo Noguchi who evidently became infected while carrying on scientific work to determine the relationship between African and South American yellow fever. His death is a loss to pathology as well as to bacteriology since the two sciences are so closely related.

BIBLIOGRAPHY

Hudson, N. P., The pathology of experimental yellow fever in the macacus rhesus. *Am. J. Path.*, 395-430. 1928.

Belk, W. R., Jodzis, F. J., Fendrick, E. The lesions in animals inoculated with streptococcus cardioarthritidis. *Arch. of Path.* VI, 812., 1928.

Wilson, J. R., Du Bois, R. O., Keratomalacia in infant with post-mortem examination. *Am. J. Dis. Child.* XXVI, 431, 1923.

Wolbach, S. B., Howe, P. R., Tissue changes following deprivation of fat soluble vitamin *A. J. Exp. Med.*, XXXXIII, 753, 1925.

Wolbach, S. B., Howe, P. R., Vitamin A deficiency in guinea pigs. *Arch. Path.* V, 239, 1928.

Pinkerton, H., The reaction of fats and oils in the lung. *Arch. of Path.*, V, 380, 1928.

MEDICINE

By F. Lowell Dunn

University of Nebraska College of Medicine

General.—The following subjects have been selected for the present year; (1) tularæmia, (2) the pituitary hormones, (3) cholecystokinin, and (4) cortin, the hormone of the suprarenal cortex. The preponderance of subjects dealing with the isolation and identification of hormones represents a rather definite tendency in medical progress. The existence of a large number of chemical substances closely associated with definite functions in the organism has been assumed for a long time, but only in part demonstrated. Apparently the development of more accurate knowl-

edge of the reactions of solutions and the technique of separations have helped to make possible further identifications of these hormones.

TULARÆMIA

This recently discovered infectious disease was recognized first by the United States Public Health Service and has been elucidated from beginning to end by American investigators alone. Its importance is that although primarily a disease of wild rodents, especially rabbits and wild hares, up to and including 1928, 604 cases have been recognized in man. Furthermore physicians in retrospect realize that certain obscure cases seen prior to the recognition of this disease were in fact tularæmia. The first scientific knowledge begins with McCoy in 1911 when he recognized a "plague-like disease of rodents" in the California ground squirrels. The following year McCoy and Chapin discovered the causative organism calling it *Bacterium tularense* after Tulare County, California. At that time they furnished serological proof of infection in two laboratory workers. Man is very susceptible to the disease and all workers who have studied it have had the disease.

Edward Francis in 1919 and 1920, while in Utah studying "deer-fly fever," recognized the identity of this disease to the "plague-like disease of rodents" and named the disease tularæmia, on account of his demonstration of the presence of *Bacterium tularense* in the blood. Definite knowledge dates from this time. Since then the prevalence of tularæmia has been demonstrated and cases have been reported from 39 states, a total of 604 cases. One attack in man confers immunity and the presence of antitularense agglutinins in the blood of recovered cases have shown in addition the existence of this disease as far back as 1904. O'Hara, in 1925, described a disease in man in Japan from dressing wild hares. Francis and Moore have shown this to be tularæmia. No other countries have recognized the disease to date.

Tularæmia is transmitted to man by the bite of the horsefly, wood tic, and by contamination of the hands or conjunctival sac with the internal organs of infected rabbits, flies or tics. The organism is a small one with variable shape requiring special media for its growth. It is easily killed by cooking but frozen rabbits are infective for three weeks. The bacteria are present in the blood stream of infected individuals early in the disease. The incubation period averaged 3½ days in 258 cases, the onset being sudden with headache, vomiting, chills, aching bodily pains, prostration and fever. The glands draining the portal of entry swell and are tender. Infection of the conjunctival sac is a common form. Apparently a scratch or cut on the hands is not necessary for starting the infection. The fever lasts for two or three weeks. Of 654 cases, 24 terminated in death.

Mistaken diagnoses are common and Francis states that clinicians often call it, "flu," septic infection, typhoid fever, sporotrichosis, and tuberculosis. Francis suggests the following tetrad for suspecting it; (1) a history of having dressed or dissected a wild rabbit, or of being tic-bitten, or fly-bitten, (2) a primary lesion of the skin followed by a persistent ulcer, or a primary conjunctivitis, (3) persistent glandular enlargements in the region draining the primary lesions, and (4) fever of from 2 to 3 weeks' duration. The diagnosis is established by agglutination tests in the second week of the disease, or by isolating the bacterium from guinea pigs inoculated with the blood of the patient.

To date no preventive vaccine nor curative serum has been perfected. The rapid increase in literature on this subject following the work of Francis indicates that tularæmia is not an uncommon disease. The great susceptibility of man makes the study of this disease very important. The American Medical Association awarded Dr. Edward Francis its gold medal this year, declaring that his contributions to the knowledge of this disease were the most important medical work of the year, judged on the basis of originality.

PITUITARY GLAND EXTRACTS

A more exact understanding of the functions of the pituitary gland products seems near at hand. The work of Evans and Long showed that the injection of anterior hypophyses from beef produced definite endocrine effects such as gigantism and sex disturbances. Evans, in his lecture before the Harvey Society (1925), regarded certain conclusions as thoroughly justified: (1) the anterior hypophysis is indispensable for growth to adult stature, a lessened amount of its hormone being the direct cause of an important group, if not all, endocrine dystrophies, and an increased amount of the hormone the direct cause of overgrowth; (2) the hypophysis stands in a necessary relationship to normal function of the thyroid, sex glands, and suprarenal cortical tissue. The anterior pituitary extracts used by Evans were somewhat crude and recently Putnam, Teel and Benedict have produced sterile active extracts which have had definite effects in animals. It serves to repair part if not all of the disabilities produced by removal of the pituitary gland. The extract has been used in one human case of pituitary insufficiency apparently with benefit.

Potent posterior lobe extracts have been in clinical use for some time, to stimulate uterine contractions in labor, to stimulate peristalsis in postoperative paralysis of the intestine, and in treating diabetes insipidus. The extracts in use have had the threefold property of producing smooth muscle contraction, raising blood pressure, and reducing the output of urine, and there have been differences in the opinion as to whether or not the extract contained one or a number of active principles. The results of a well-conducted research by Kamm, Aldrich, Grote, Rowe, and Bugbee show rather convincingly that there are two active principles, one having the property of contracting smooth muscle, while the other that of raising blood pressure and diminishing the flow of urine. They have succeeded in increasing the potency of the oxytocic hormone (smooth muscle contracting) to 80 times that of the International Standard Powdered Pituitary solution, while the pressor hormone preparation is 150 times stronger. Efficient manufacturing methods have already been developed and these workers have shown that previous methods produced little or no separation of the two principles accounting largely for the widespread belief in America that there was only one principle. Physiological investigations will be made more readily understandable by the separation of these principles and their clinical value more easily determined.

CHOLECYSTOKININ

The mechanism of the emptying of the gall bladder has had what appears to be a much needed clarification in the work of Ivy and Oldberg. Secretin, a hormone found in the upper intestinal mucosa, has been further purified and a substance obtained which has a marked effect on producing contraction of the gall bladder. Following injections of the "purified secretin" an average increase of 11 cm. bile pressure occurs. Secretin is formed when acid is poured on to the duodenal mucosa and Ivy and Oldberg have shown that when the circulations of two animals are connected together, the injection of acid into the duodenum of one dog will produce gall bladder contraction in the other animal, demonstrating that the contraction is produced by something circulating in the blood.

The new substance has been named "cholecystokinin," that which excites or moves the gall bladder. Inasmuch as they have shown that any substance which lowers blood pressure will produce gall bladder contraction these investigators have proven that cholecystokinin does not act by lowering blood pressure. It is not a choline since atropine does not abolish its effect. It is interesting that the new hormone will not completely empty the gall bladder regardless of dosage. Doses of 2 milligrams in dogs are sufficient.

CORTIN

This is the name which E. A. Hartman and his associates have given

to a new hormone which they have isolated from the cortex of the suprarenal gland. The necessity of the suprarenal glands for life was shown as far back as 1856 by Brown-Sequard. In 1898 J. J. Abel isolated a hormone from the suprarenals, now widely used as epinephrine. For a time it was thought that epinephrine was the indispensable hormone but experiments showed that its administration would not support life in a suprarenalectomized animal. It was further demonstrated that the medulla of the gland could be removed without a fatal outcome in contrast to removal of the cortex, which resulted in death. Attempts to isolate the hormone in the cortex have not been satisfactory, but the work of Hartman and his associates and Stewart looks very promising. Hartman has shown that cats receiving his extract and with their suprarenal glands removed will live an average of 27.4 days. Similar cats not receiving the extract live only 5-6 days. This replacement type of experiment leaves but little doubt that an active principle is being obtained. Apparently one of the difficulties in previous work was to get rid of the interference of epinephrine, which these investigators destroyed by the use of potassium permanganate and then removed by the use of charcoal. Experiments are already under way to study the various stages of hyposuprarenalism. These stages are produced by removing the suprarenal glands and giving the animals less than the necessary amount of the extract. To date the effect on Addison's disease has not been reported.

ANNIVERSARIES IN MEDICAL PROGRESS

Harvey Tercentenary. — This is rather a unique anniversary year of singular points in the progress of medicine. William Harvey published his proofs in 1628 that the blood moved continuously in one direction only, the heart acting as a force pump. Animal experiments, ligations of vessels, and perfusion experiments over a period of seventeen years convinced Harvey that the quantities and velocities of blood flow he had observed made it impossible for the blood to flow in any other way. Aside from its tremendous significance in laying the foundation for studies of the circulation, this work is quoted as the first application of the idea of measurement in the study of biological phenomena. Harvey's publication of his discovery caused an immediate falling off in his practice, but the effect on medical science was prompt and decisive.

John Hunter was born in 1728. Garrison remarks in his *History of Medicine* that Hunter's permanent position in science is based on the fact that he was the founder of experimental and surgical pathology, and a pioneer in comparative physiology and experimental morphology. His versatility was great. He was the first to study teeth in a scientific manner, and the first to recommend complete removal of the pulp before filling them. Edward Jenner was a pupil of Hunter.

Friedrich Wöhler, pupil of Liebig, published his discovery of the synthesis of urea in 1828. This discovery, the outcome of a series of investigations of cyanic acid and its compounds, represented the first production in the laboratory of an organic substance without the intervention of living matter. In his article of four small pages, detailing what has been called one of the most important contributions to chemistry, Wöhler said: "I obtained the unexpected result that, when cyanic acid and ammonia are combined, urea is produced. This fact is all the more remarkable because it offers an example of the artificial formation of an organic compound, moreover of an animal substance, by means of inorganic materials." It was twenty years before another example of such a synthesis appeared, this being acetic acid in 1845 by Kolbe, one of Wöhler's pupils. Organic chemistry began at this time. During Wöhler's lifetime he published over 250 original papers.

Jean Léonard-Marie Poisseuille in 1828 adapted the mercury manometer to blood pressure readings, his method being but little different from that in use today in physiological labora-

tories,—a mercury manometer connected by a cannula and tubing to the blood vessel with a strong solution of sodium carbonate to prevent clotting of the blood. When one considers the widespread knowledge and use of blood pressure readings in medicine today it is surprising that three-quarters of a century elapsed before blood pressure readings came into general use.

WORK OF NOGUCHI AND EINTHOVEN

Yellow Fever.—The death of Dr. Hideyo Noguchi May 21 adds an internationally known bacteriologist to yellow fever's long list of scientific martyrs. Doctor Noguchi in 1918 isolated a germ which he believed to be the cause of yellow fever in South America. He developed a preventive vaccine and a serum which was fairly effective if given early in the disease. The stamping out of the stegomyia mosquito, the carrier, practically wiped the disease out of the Western Hemisphere. However, the disease continued in West Africa and, according to epidemiologists, should be stamped out before a transcontinental railway could be built across Africa, the dangers of introducing the disease into India and Southern China being too great. Investigations in West Africa had indicated that the yellow fever there was different from the South American form, and Noguchi, the universally acknowledged authority, undertook personally to study the West African form. He had completed his work and had arranged to sail for New York, May 19, but became infected and died.

Noguchi's Other Works.—The realization of the loss of men whose investigations determine the futures of continents makes words ineffective. Among his other contributions were: pure cultivation of the syphilitic organism, demonstration of the presence of the syphilitic organism in the brain in general paresis and in the spinal cord in locomotor ataxia, the introduction of a bacteria-free vaccine for smallpox, and his work on rabies, as well as trachoma and infantile paralysis.

Einthoven String Galvanometer.—Willem Einthoven died on September 29th at the age of 57. Turning points in progress are made with the introduction of new methods. He was called to the Chair of Physiology at Leyden at the age of 25 and remained there actively engaged in his work until his death. Early in his career he became interested in instruments which would record changes in electrical current or potential, and perceiving their great importance in physiological research, he deliberately set out to construct an instrument of unsurpassed quickness and sensitivity. The result was the Einthoven String Galvanometer, essentially a very powerful electromagnet with a fine wire carrying the small current stretched between and parallel to the pole pieces. The small current flowing through the wire caused it to move in the strong magnetic field and high power lenses and objectives magnified this movement which was recorded photographically. His instrument was basically the galvanometer designed by Ader for recording submarine signals except that it was 100,000 times more sensitive. He developed it to record such minute time intervals as a hundred thousandth of a second. The development of the string galvanometer permitted the extensive study of nerve, muscle, and heart physiology, and today the string galvanometer is a part of most cardiac clinics, and few physiological laboratories are without one. Later he applied his galvanometer to the study of heart sounds and he made quartz fibers only two or three millionths of an inch in diameter to substitute for the fine wires he had used previously. Sound waves of 150,000 vibrations per second, he recorded photographically. An obituary says, "Einthoven's work will be remembered for all time for the greatness of his contribution to method."

PHARMACOLOGY

By Harry Gold

Cornell University Medical School

PROGRESS

Ann Arbor Meeting.—The American Society of Pharmacology and Experimental Therapeutics held its annual meeting at Ann Arbor, Mich., April, 1928. Over thirty papers covering a wide range of pharmacologic subjects were presented. Few outstanding discoveries are recorded in this field during the past year; nevertheless our knowledge has been improved and extended in various directions by numerous investigations of newer and better methods.

Electromotive Theory.—A notable feature in pharmacologic discussions has been the interest displayed in the application of electrical theories to the explanation of pharmacological reactions. Many researches have been reported showing that pharmacological and physiological changes may depend upon an underlying electrical mechanism. Very sensitive, artificial physico-chemical systems have been devised to simulate those existing in the tissues of the body. When drugs are added, changes in electromotive forces can be observed which explain certain actions of these drugs on animal tissues. Thus Beutner observed that the phenomenon that sodium oleate, which itself has no action, can increase the constrictor action of pilocarpine upon the intestine only within given concentrations of the former and can be reproduced in a physico-chemical system in which the action of pilocarpine is measured in millivolts. None of the former theories could adequately explain this phenomenon.

Chemistry in Medicine.—This is the title of a very interesting volume compiled at the request of Mr. and Mrs. Francis P. Garvan and published this year by the Chemical Foundation. The book contains ten chapters written by authorities in a popular style and dealing with those advances in the biological sciences in which chemistry has played a vital rôle. It is admirably executed to stimulate popular interest in and patronage for research in the chemical phases of medicine and to promote coöperative efforts of these related sciences. The book makes a strong appeal in the dedication to the welfare of children in memory of the tragic death of the child, Patricia Garvan, from an acute infection which physicians were unable to check due to the limitations of knowledge.

ADDICTION TO MORPHINE

Despite the enormous literature dealing with the subject of morphine habituation, our knowledge of the underlying mechanism by which habituation occurs is still very unsatisfactory. Many of the theories held at the present time are based on researches carried out over twenty-five years ago with technique and controls that were very inadequate. It has been held that addiction is due to an increased capacity of the body to destroy morphine. Recent experimental studies by Plant, Livingston, Hatcher and Gold have shown that the tissues of habituated animals possess no greater capacity to destroy morphine than those of normal animals; that the tissues of habituated animals can store morphine without being influenced by it; and that habituation is therefore in all probability due to the development of a tissue immunity.

HYPNOTICS

Those substances which depress the nervous system and induce sleep have a wide field of usefulness in therapeutics. The barbituric acid series of drugs are most commonly employed and numerous efforts have been made —mainly by manufacturing chemists —to modify the chemical structure of these substances as to diminish their toxicity and enhance their hypnotic and analgesic properties. A

large number of these drugs have appeared on the market and are widely advertised among physicians, each claiming various points of superiority. The claims made were usually based at the outset upon the results of experiments on animals.

Eddy made an extensive investigation in which he compared the pharmacologic actions of several of the barbituric acid derivatives. His results show clearly that these substances show no essential differences in behavior and that a diminution in the toxicity of a substance follows fairly closely a loss in therapeutic efficiency. Thus marked pharmacologic differences in evidence from experimental work carried out by manufacturers almost completely disappeared when similar experiments were carried out by one entirely disinterested and in such a way as to make the identity of the drug unknown to the experimenter until the interpretation of its action had been recorded.

EPHEDRINE

Ma Huang was employed in Chinese medicine for many centuries and in 1887 Nagai obtained the active alkaloid, ephedrine, which has been popularized only in the last few years through the work of Chen and others on animals and man. Epinephrine has very striking actions and numerous uses in therapeutics but its application is limited by the fact that it is destroyed readily in the intestinal tract and must therefore be given by injection. The discovery, therefore, that ephedrine is an amine belonging to the epinephrine series, possessing many of the latter's actions, and that these are most lasting and can be elicited when the drugs is given by mouth, aroused a great deal of interest.

Further researches, however, have shown that the initial enthusiasm over the possibility that ephedrine might displace epinephrine for the relief of asthma, for stimulation of the circulation, and for the relief of congested mucous membranes was not altogether justified. It has been shown that repeated injections of ephedrine cause a fall rather than a rise in the blood pressure and that injury to the heart may occur. It has also been found much less effective in asthma than epinephrine. The more recent work has further defined the therapeutic limitations of the drug as well as its dangers, so that at the present time the local effect upon mucous membranes remains as its only unquestionable practical usefulness.

COPPER IN ANEMIA

Iron is the inorganic element that has enjoyed the greatest popularity in the treatment of anemia. There appears to be little doubt that in certain forms of anemia, iron has some value, but equally certain it is that in other forms it produces practically no beneficial effects. Researches have dealt in the past mainly with the question of the form of iron that is employed, organic or inorganic, soluble or insoluble iron preparations. The results of these investigations have shown that there is no essential difference between the various forms of iron; and the treatment of anemia from this angle made but little progress.

For this reason great interest was aroused by the recent discovery of the Wisconsin workers, Hart, Steenbock, Waddell and Elvehjen, that copper in minute quantities added to iron cures or prevents a given form of anemia in animals. When rats are placed on a milk or a milk and bread diet they develop a progressive "nutritional anemia." They found that highly purified inorganic iron did not increase the hemoglobin but that foods such as liver, lettuce, and corn, as well as the inorganic residues of these foods cured the anemia. By further ingenious experimentation they discovered that minute quantities of copper in these substances was responsible for the curative effects. The experiments have therefore shown a new element to play an important rôle in hematopoetic functions and have opened the door to further researches that may lead to the discovery that other inorganic elements may beneficially influence this function.

CAMPHOR

The general belief in the efficiency of camphor as a circulatory stimulant has resulted in the production of a number of related synthetic substances which would be soluble in water. These have attained quite a vogue due rather to skillful advertisement than to any evidence of inherent value. At the present time the action of camphor is being investigated in one of the large hospitals of New York upon patients with heart failure. Should these studies prove that camphor has value, the relative position of this drug among cardiac stimulants may be better defined. Should they prove, however, that camphor has no influence, the work will help to discourage the use of another therapeutic myth of which there are far too many already present in the physicians' armamentarium.

SURGERY

By Herbert H. Davis

Director, Laboratory of Experimental Surgery, University of Nebraska

General.—It is only at long intervals that startling, great discoveries are made in surgery. Surgery, at the present day, is the work of a great many small improvements made from time to time. An operation will be devised; a few years later some one will improve one point; another year some other point will be improved and the operation as done then will be the original principle with a group of these improvements attached. This year, I can speak of no new principles, but there are two conditions which are receiving a great deal of work: they are surgery of ulcer of the stomach and duodenum, and the injection treatment of varicose veins.

ULCER OF STOMACH AND DUODENUM

Discussion of Treatment. — The term "peptic ulcer" includes ulcers located either in the stomach or the portion of the intestine just beyond the stomach. In recent years there have been many talks at medical societies debating whether these cases should be treated medically or surgically. The medical men would dispute whether one form of treatment is not better than another. The surgeons would debate as to what type of operation is the best. Therefore, I am going to sum up the most generally accepted opinions.

Surgery After Medical Treatment.—This disease is not a purely medical or a purely surgical condition. An acute ulcer, or one which has no severe complications and has not had medical treatment should be given the benefit of that treatment rather than operation. Eighty to ninety per cent of the cases can be cured this way. Surgery should be resorted to in the medical failures, and in certain complications such as repeated hemorrhages, perforation of the stomach, obstruction of the outlet of the stomach, and in cases of gastric ulcer where there is danger of cancer.

Choice of Operation.—Having decided on surgery, there are differences of opinion as to the operation of choice. It is unfortunate that the world has not a universal language in order that medical men could better exchange ideas. The different forms of treatment seem to go with different languages. For instance, the attitude in America and England are much the same. In Germany, Austria, and all German speaking countries, it is entirely different from the American attitude, but the German speaking countries all agree. In France, they have their own ideas.

Gastro-Enterostomy. — In the United States, the operation which is used in most cases is that called "gastro-enterostomy." In that operation, a new opening is made between the stomach and the small intestine. By that means, the stomach is allowed to empty quickly, which in many cases before operation was slow

to empty, the food does not go over the ulcer but gives it a rest, and the alkaline secretion of the small intestine empties to some extent through this new opening to neutralize the acid in the stomach. In most of these operations the results are quite satisfactory. However, there are some cases which are not benefited or have late complications.

German Methods of Operating.—In Germany, stomach surgery is much more radical, and better results are claimed. Two-thirds of the stomach are removed, and the first part of the duodenum. In the last ten years or so, these radical operations have practically superseded gastro-enterostomy, which they previously did. By doing this radical operation the ulcer itself is removed and the area of the stomach in which the ulcer is prone to appear is removed. The Germans consider high acid to be a cause of ulcer and by removing this much of the stomach the acid is greatly reduced, thereby preventing new ulcers from forming, and also relieving pain. In this country we say they are too radical and their operation too dangerous. They, on the other hand, reply that their immediate mortality is slightly higher, being 3% for radical operation, while gastro-enterostomy is 1%; but the mortality of later complications after gastro-enterostomy would bring that mortality higher than if re-section had been done originally. They claim better late results by this method.

INJECTION TREATMENT FOR VARICOSE VEINS

Varicose veins of the leg occur quite frequently and especially with people who must do a great deal of standing. They are often the cause of considerable disability. As the veins become dilated the circulation to the limb is disturbed, resulting in swelling, induration of the tissues, pain, and often ulceration. These ulcers are very chronic and hard to heal. In the past the surgeon has felt that operation is necessary for the more extensive cases which are not relieved by tight bandages, elastic stockings, etc. In these operations the dilated veins are excised or ligated in many places. This results usually in long incisions which are very slow to heal, due to poor circulation, and leave long unsightly scars. This method entails a long period of disability lasting usually several months, risk of infection, necessitating usually a general anesthetic, and a considerable amount of pain and distress.

In the last year the method of obliterating the veins by injection of sclerosing solutions has become very popular. It is not new but until recently has not been used much. This treatment is the most modern and efficient method in typical cases of varicose veins. It accomplishes better and more thorough results than operative treatment and has added advantages of not necessitating hospitalization, anesthetization, bed rest, loss of time from work, risk of infection, and extensive operative incisions. When proper technique is employed, no disfiguring scars are left and there is less danger of a clot forming in the veins and being carried to the lungs than from operative procedure.

The principle of this treatment is to inject a solution which does not cause clotting of blood but causes enough chemical irritation of the inside of the vein wall so that when the vein is compressed with a firm bandage, the two sides of the vein are held together, thus obliterating it. The final result is just a fibrous cord which contains no blood and, therefore, no stagnation of circulation. Its result is the same as removal of the vein except that the tissues have not been damaged by an operation.

Solutions commonly employed are ordinary salt in a twenty per cent solution; sodium salicylate in twenty, thirty, and forty per cent solutions; concentrated sugar solutions such as glucose, levulose, or calorose, quinine and urea; one per cent solution of mercuric chloride, etc. The ideal solution should not be strong enough to irritate the veins greatly and cause pain. If the needle should slip out of the vein and some of the solution be accidentally injected in the tissues, it would not produce an infection and

slough there. The sugar solutions are best in regard to not producing a slough if they get in the tissues, but occasionally do not produce enough irritation to obliterate the vein completely. In such a case a more irritating solution such as sodium salicylate may be used.

This treatment does not incapacitate the patient but can be done in the doctor's office, enabling the patient to go about his regular work. A moderate case would probably need three to five injections, which can be done a few days apart. Contra-indications of this treatment are old people with debilitated conditions, invalids confined to bed with poor circulation, chronic heart and kidney conditions, etc. In case of ulcer of the leg due to varicose veins, the initial treatment should be to obliterate the varicose veins and then the ulcer itself will be much more easily healed with the proper treatment. The injection treatment, while not without some danger, is the safest, quickest, and gives the best results of any treatment so far known for varicose veins.

DENTISTRY

By William B. Dunning

Professor of Dentistry, Columbia University

ORGANIZATIONS AND MEETINGS

Association Activity.—The past year has been one of marked activity in dental associations. Perhaps there has never been more keen appreciation on the part of the private practitioner at large of the usefulness of the local society as a means of keeping himself in touch with the rapid progress in matters of practical knowledge, and of the opportunity therein to contribute his share in such advances. This local interest in the work of organized dentistry is reflected in the fine programs of the state and National associations, and in the record as it appears in our current literature.

American Dental Association.—The outstanding event of this kind was the meeting of the American Dental Association at Minneapolis, Minn., August 20-24, which drew many thousands of members and delegates from state societies. A large and important program, literary and clinical, was carried out in the new auditorium of that city. Besides the general sessions, section meetings in the various departments of dentistry were held simultaneously in that remarkable building. The clinics, given by operators throughout this country and Canada, and exhibitions furnished by various dental schools, covered very fully the field of dental science today. A plan of redistricting the Association whereby the Board of Trustees was increased in number was adopted, and this change, it is believed, will make the work of the Association more representative as a national body and improve the efficiency of its administration.

National Board of Dental Examiners.—An important piece of business was the establishment of a National Board of Dental Examiners, consisting of five members of this association and five each from the National Association of Dental Examiners and the American Association of Dental Schools. It is hoped that this National Board will become a clearing house for many interstate dental, legislative and educational matters.

The American Association of Dental Schools met in Washington, March 26-28. This association was formed in 1923 by the merger of the Canadian Dental Faculties Association, the American Institute of Dental Teachers, the National Association of Dental Faculties, and the Dental Faculties Association of American Universities. Its membership represents all the accredited dental schools in the United States and Canada. At the same time, also in Washington, the International Association for Dental Research held its sixth annual meeting.

EDUCATION

Evolution of the dental school from a proprietary institution in the near past to an essential unit in the modern university has progressed rapidly during the last decade, and particularly since the publication of the Carnegie survey of existing conditions in 1926. At the present writing practically all the accredited schools in the United States and Canada are under university management, but it cannot as yet be said that the university status in the best sense has been adopted by all of these institutions. Adequate endowments will do away with the necessity for self-support through a large student body,—now unfortunately still existing in a number of university dental schools—and the advance of the predental requirement to two years of college work, now required in many states, will lead to the selection of better material, in the first instance, for students in dentistry. The leading universities are thoroughly awake to this new and important advance and substantial progress is being made to secure the interest and support of the people at large, in a matter essential to public health.

RESEARCH

Wide Range of Studies.—The volume of research in dental and allied problems by trained investigators is steadily increasing, and the past year has been one of notable achievement. At the meeting of the International Association for Dental Research, March 25-28, reports on forty-seven independent studies covering a wide range of interest were presented.

Development and Nutrition.—Much attention has been given to problems of development and nutrition. Studies on inorganic salt metabolism,—of the effect of faulty diet on dental and skeletal development during pregnancy in animals, of the prevalence of so-called "mottled enamel" in certain districts due apparently to the drinking water; important studies in periodontoclasia or pyorrhea, the supporting structures of the teeth in relation to diet, etc. Problems in metallurgy, in the mechanics of restorative dentistry, or in the technical procedures in orthodontia, are constantly in hand, but the biological factors underlying our dental troubles with a view to prevention at the source is the great theme, and the most hopeful aspect of the research program today.

Dentifrices and Mouthwashes.—An important work, undertaken simultaneously by the American Dental Association and by the New York Academy of Dentistry, is the examination by competent experts of the multitudinous preparations now on the market in the shape of dentifrices and mouthwashes, the publication of the chemical composition of each specimen, with definite information as to its harmless or dangerous character, or its useful or useless properties. This is an important step scientifically. The large commercial interests involved in the exploitation of a "best seller" dentifrice have overwhelmed, in the past, any sporadic efforts to inform the public as to misleading advertisements or injurious qualities; the threat of a libel action and of possible heavy damages has kept the field clear. This state of affairs is already a thing of the past. In current issues of the *Journal of Dental Research* and the *Journal of the American Dental Association* may be found explicit statements of the actual ingredients of proprietary articles and of the truth or falsity of the claims made by their manufacturers.

DENTAL PRACTICE

The practice of any profession reflects the advance made by those who explore the boundaries of its science, and in this sense recent dental practice has followed, somewhat cautiously, the lead of its investigators. No extraordinary event or sudden change is to be recorded here. Perhaps greater conservatism prevails concerning the problem of the pulpless tooth as related to systemic disease. The methods of treatment of such teeth, to insure permanent sterility and the health of their investing tissues, have not yet been reduced to simple procedures, nor proved to be dependable.

or not teeth which have lost vitality should be retained in the human machine is still debatable, and may so remain for a considerable time to come. Surgical and restorative measures in dentistry have been pretty thoroughly standardized. The uncertain borderline runs into questions of the relation of dental infections to systemic disorders, of the vital tone of tissues supporting the teeth, and of pulp preservation through the very necessary prevention of dental decay.

PUBLIC HEALTH AND HYGIENE

By C. E. A. Winslow

Professor, Yale University Medical School

A Martyr to Science.—No review of public health in 1928, however brief, can omit reference to an outstanding tragedy in this field,—the death from yellow fever of Hideyo Noguchi in British West Africa on May 21. This brilliant Japanese investigator had been for nearly twenty-five years on the staff of the Rockefeller Institute for Medical Research. His studies on syphilis, rabies, smallpox, infant paralysis and yellow fever placed him in the forefront of medical research. His death, from infection contracted in the course of his investigations, adds his name to the long and glorious honor roll of those who have given their lives in the war against insect-borne disease.

West African Yellow Fever Studies.—The studies carried on by the band of investigators with whom Noguchi was associated have meanwhile begun to yield results worthy of his sacrifice. The following are perhaps the major facts which appear to be demonstrated at the present time: the disease prevalent in Southwestern Nigeria is identical with the yellow fever of the Americas. It cannot be transmitted to guinea-pigs or to native West African monkeys but can be conveyed to the Indian monkey, *Macacus rhesus*. The cause of the disease is, at some stages at least, a filterable virus, and *Leptospira icteroides* probably bears no causative relation to it. Convalescent serum has a strong immunizing effect. The virus may be carried by several other mosquitoes besides *Ædes ægypti*,—one of them not even belonging to the same genus. The time relations involved in the transmission of the disease have been worked out with far greater precision than before. Altogether, the work done by this expedition has perhaps brought us farther in our knowledge of yellow fever than any single study made since the foundations were laid by Reed and his associates in 1900. (See *Public Health Reports*, U.S.P.H.S. for August 3.)

The Cause of Trachoma.—It is a dramatic fact that Noguchi has left us another posthumous contribution of the first importance, quite aside from his studies on yellow fever. This is the announcement of the long-delayed discovery of the causative agent in trachoma. He presents strong evidence that the active organism is a bacillus, *Bact. granulosis;* and he has been able to produce with this organism a disease closely resembling trachoma in *Macacus rhesus* monkeys, in the chimpanzee and in the baboon. The disease has been transmitted in these animals for four successive passages. (Supplement No. 2 to Vol. XLVIII, No. 2 of the *Journal of Experimental Medicine* for August 1.)

Treatment of Poliomyelitis.—While the control of the spread of poliomyelitis remains beyond our powers, notable progress has been made in the treatment of this disease. Aycock and Luther (*Journal of the American Medical Association*, August 11) report that the administration of convalescent serum during the preparalytic stage greatly lowers mortality and average severity of paralysis, and almost abolishes paralysis of the more severe type. The importance of early diagnosis of this

disease is therefore of fundamental importance.

Undulant Fever.—Studies conducted in many different countries continue to emphasize the importance of undulant fever and the extent to which it prevails in unrecognized form. Madsen in Denmark finds that out of 2500 blood samples examined, 9 per cent proved positive for undulant fever and only 7 per cent for typhoid (*Epidemiological Report* No. 114, League of Nations Health Committee, May 15). In a symposium at the Chicago meeting of the American Public Health Association, a report from Connecticut showed that out of 20,000 blood samples, about one-half of one per cent were positive for undulant fever. In Tennessee, however, a smaller series gave over one per cent positive tests for undulant fever, nearly one per cent positive for endemic typhus and three per cent positive for tularemia. Clearly, there are many undiagnosed cases of all three of these obscure maladies occurring in various parts of the world. It is an interesting fact that in Madsen's series, and in a series of cases reported from Iowa (*Public Health Reports*, U.S.P.H.S., Sept. 21), direct contact with livestock (rather than the drinking of infected milk) was prominent as a source of infection in undulant fever.

BCG.—The Calmette vaccine for producing immunity against tuberculosis continues to be a subject of hot debate. The general trend of sentiment in the United States continues to be unfavorable. Petroff, who has derived a virulent "S" type of tubercle bacillus from the Calmette strain, takes a specially vigorous position in opposition (*American Journal of Public Health*, July). On the other hand, reports from many parts of Europe are favorable. The Health Committee of the League of Nations plans an international conference to initiate a study of the problem.

Report on Milk Supply.—A Committee on Milk of the American Public Health Association, under the chairmanship of W. H. Park, has made a lengthy and most valuable contribution to this subject which should go far toward settling the controversies which have raged in regard to pasteurization procedures during the past five years. It will be published as a special bulletin of the United States Public Health Service.

Progress in Sewage Disposal.—In the field of sanitary engineering, the most significant trend of 1928 has been in the line of successful treatment and disposition of activated sludge. Milwaukee has apparently now worked out a plan for handling its sludge which is not only inoffensive but financially profitable (*Industrial and Engineering Chemistry*, January). Pasadena has attained similar results along somewhat different lines and has also successfully treated the gases from the plant by incineration (*Engineering News-Record*, Sept. 27). Chicago has opened the largest activated sludge plant in the world for treating 175 million gallons of sewage a day from its North Side district (*Engineering News-Record*, Oct. 11).

Cancer Problems.—Widespread interest is everywhere manifest in the problem of cancer, recognized as perhaps the outstanding challenge to public health workers of the future. The Registrar-General of Great Britain has presented data which show that the incidence of cancer (like that of tuberculosis) is greatest in social classes of low economic status. The British Ministry of Health encourages us with statistics indicating highly favorable results from early operations for cancer of the breast. Where the growth was localized and had not invaded the glands at the time of operation, 73 per cent of the patients were alive after ten years. The cancer program of the state of Massachusetts,—perhaps the most ambitious of its kind in the world—continues to progress steadily and sanely (*American Journal of Public Health*, April).

Health Education Reduced to a Science.—Outstanding among the notable health books of the year is *Publicity for Social Work* by M. S. and E. G. Routzahn (Russell Sage Foundation). In this volume the authors discuss the arts of attracting

and holding attention, of securing good will and obtaining a response in the form of the specific action desired. They review the technique involved in popular instruction by means of newspapers, special printed matter (including format and distribution), public meetings, exhibits, and intensive campaigns. The book is sane and scientific in temper and contains invaluable technical hints for all who are engaged in mass-motivation.

Nursing and Nursing Education.—In last year's review reference was made to preliminary results of the Committee on the Grading of Nursing Training Schools. At the Louisville Biennial Convention of the national nursing organizations the final result of the first phase of the Committee's studies (dealing with Supply and Demand in Nursing) was presented in the form of a volume entitled *Nurses, Patients and Pocketbooks*. Dr. May Ayres Burgess, Director of Research for the Committee, presents conclusive proof that the organization of private duty nursing is gravely faulty, and that the nursing profession is over-populated. The implications—that better community organization for nursing of all kinds should be developed,—that graduate nurses should largely replace pupils in hospital nursing—and that nursing schools should be adequately endowed to educate fewer nurses better—are reasonably clear.

New Appraisal Form.—Among the events of the Chicago meeting of the American Public Health Association was the presentation by the Committee on Administrative Practice of the first triennial revision of the Appraisal Form for City Health Departments. The new form has been completely revised and expanded so as to include community services for dealing with heart disease and that of cancer.

The Parker Bill.—For some years, public health workers throughout this country have labored earnestly for a modest but important reorganization of the United States Public Health Service, embodied in a measure known as the Parker Bill. This bill at last passed both houses of Congress but was vetoed by President Coolidge. Its passage is essential to the efficiency of the Federal health service and further efforts will be made to secure its passage during the coming winter.

VITAL STATISTICS

By William H. Davis

Chief Statistician for Vital Statistics, U. S. Bureau of the Census

FEDERAL STATISTICS

Federal mortality and birth statistics are compiled for only that part of the United States known as the "death registration area" and the "birth registration area." (Mortality Statistics and Birth, Stillbirth, and Infant Mortality Statistics—annual reports—published by the Bureau of the Census). A "registration area" is that portion of the United States recognized by the Federal Government as having adequate registration laws, and at least 90 per cent complete registration. In 1928, the death registration area included 44 states, the District of Columbia, the Territory of Hawaii, the Virgin Islands, and ten registration cities in nonregistration states, or 95.4 per cent of the total population: the birth registration area, composed of these 44 states, the District of Columbia and the Virgin Islands, included 94.4 per cent of the total population.

Death rates.—The death rate of the registration area for 1927 was 11.4. Of the 1,236,949 deaths which occurred in the death registration area in 1927, more than one-half were due to six causes: diseases of the heart, cancer, nephritis, tuberculosis, influenza and pneumonia, and bronchitis and bronchopneumonia. The death rate from accidents (excluding automobile accidents) has declined from 73 per 100,000 population in 1918 to 58.9 in 1927, but the death rate from

STATES IN DEATH REGISTRATION AREA

State	Year Admitted	State	Year Admitted	State	Year Admitted
Massachusetts	[1]1880	Pennsylvania	1906	Illinois	1918
New Jersey		South Dakota[4]		Louisiana	
Dist. of Columbia[2]		Washington	1908	Oregon	
Connecticut	[1]1890	Wisconsin		Delaware	1919
Delaware[3]		Ohio	1909	Florida	
New Hampshire		Minnesota	1910	Mississippi	
New York		Montana		Nebraska	1920
Rhode Island		North Carolina[6]		Georgia[7]	1922
Vermont		Utah		Idaho	
Maine	[1]1900	Kentucky	1911	Wyoming	
Michigan		Missouri		Iowa	1923
Indiana	1900	Virginia	1913	North Dakota	1924
California	1906	Kansas	1914	Alabama	1925
Colorado		North Carolina[6]	1916	West Virginia	
Maryland		South Carolina		Arizona	1926
		Tennessee	1917	Arkansas	1927

[1] Census year ending May 31.
[2] Included in registration states.
[3] Dropped from the area in the census year 1900.
[4] Dropped from the area in 1910.
[5] Included only municipalities having a population of 1,000 or more in 1900.
[6] The remainder of the State of North Carolina was added to the registration area in 1916. (See note 5.)
[7] Dropped from the area for 1925; state registration law declared unconstitutional.

STATES IN BIRTH REGISTRATION AREA

State	Year Admitted	State	Year Admitted
Connecticut	1915	California	1919
Maine		Oregon	
Massachusetts		South Carolina[3]	
Michigan		Nebraska	1920
Minnesota		Delaware	1921
New Hampshire		Mississippi	
New York		New Jersey	
Pennsylvania		Illinois	1922
Rhode Island[1]		Montana	
Vermont		Wyoming	
District of Columbia[2]		Florida	1924
Maryland	1916	Iowa	
Indiana	1917	North Dakota	
Kansas		West Virginia	1925
Kentucky		Arizona	1926
North Carolina		Idaho	
Ohio		Alabama	1927
Utah		Arkansas	
Virginia		Louisiana	
Washington		Missouri	
Wisconsin		Tennessee	

[1] Dropped from the area in 1919; readmitted in 1921.
[2] Included in registration states.
[3] Dropped from the area in 1925.

automobile accidents has increased from 9.3 to 19.5.

Infant Mortality Rates.—The infant mortality rate for the birth registration area was 65 for 1927, strikingly less than the 1915 rate,—100—and the lowest since that year.

Birth Rates.—The birth rate of the birth registration area for 1927 was 20.6, the same as for 1926, the record low rate since the establishment of the area in 1915, which year had a record high rate of 25.1. The rate of natural increase indicated by the difference between the birth rate and the death rate was 11 per 1,000 for the year 1915, 8.4 for 1926, and 9.2 for 1927.

BIRTH REGISTRATION AREA: 1915 TO 1927

Year	Birth Registration Area								
	Population [1]		Land Area		Births [2]		Deaths [2]		
	Number	Per Cent of United States Total	Square Miles	Per Cent of United States Total	Number	Rate per 1,000 Population	Number	Rate per 1,000 Population	Deaths of Infants Under 1 Year of Age per 1,000 Births
1915	30,936,179	31.1	292,860	9.8	776,304	25.1	436,593	14.1	100
1916	32,788,670	32.5	302,801	10.2	818,983	25.0	486,682	14.8	101
1917	54,771,416	53.6	794,819	26.7	1,353,792	24.7	776,222	14.2	94
1918	55,515,241	53.6	794,819	26.7	1,363,649	24.6	996,627	18.3	101
1919	61,483,423	58.6	1,075,506	36.2	1,373,438	22.3	798,104	13.0	87
1920	63,659,441	59.8	1,152,314	38.7	1,508,874	23.7	836,134	13.1	86
1921	70,425,705	65.3	1,209,224	40.7	1,714,261	24.3	825,511	11.7	76
1922	78,885,852	72.2	1,508,946	50.7	1,774,911	22.5	938,545	11.9	76
1923	79,952,425	72.2	1,508,946	50.7	1,792,646	22.4	992,237	12.4	77
1924	85,424,653	76.2	1,689,576	56.8	1,930,614	22.6	1,006,994	11.8	71
1925	87,636,000	76.0	1,683,103	56.6	1,878,880	21.4	1,030,518	11.8	72
1926	89,988,000	76.8	1,880,267	63.2	1,856,068	20.6	1,093,511	12.2	73
1927	103,591,000	87.3	2,139,894	72.0	2,137,836	20.6	1,176,805	11.4	65

[1] Estimated July 1.
[2] Exclusive of stillbirth.

DEATH REGISTRATION AREA: 1880 TO 1927

Year	Estimated Population, July 1, of Continental United States	Registration Area in Continental United States					
		Estimated Population, July 1		Land Area		Deaths from All Causes [1]	
		Number	Per Cent of Total	Square Miles	Per Cent of Total	Number	Rate per 1,000 Population
1927	118,628,000	108,327,000	91.3	2,274,398	76.5	1,236,949	11.4
1926	117,136,000	105,170,000	89.8	2,221,892	74.7	1,285,927	12.2
1925	115,378,000	103,108,000	89.4	2,108,072	70.9	1,219,019	11.8
1924	112,078,611	99,200,298	88.5	2,091,456	70.3	1,173,990	11.8
1923	110,663,502	96,986,371	87.6	2,021,237	68.0	1,193,017	12.3
1922	109,248,393	93,241,643	85.3	1,965,589	66.1	1,101,863	11.8
1921	107,833,284	88,667,602	82.2	1,726,012	58.0	1,032,009	11.6
1920	106,418,175	87,486,713	82.2	1,726,012	58.0	1,142,558	13.1
1919	105,003,065	85,166,043	81.1	1,649,281	55.5	1,096,436	12.9
1918	103,587,955	81,333,675	78.5	1,546,166	52.0	1,471,367	18.1
1917	102,172,845	74,984,498	73.4	1,349,629	45.4	1,068,932	14.3
1916	100,757,735	71,349,162	70.8	1,307,819	44.0	1,001,921	14.0
1915	99,342,625	67,095,681	67.5	1,228,704	41.3	909,155	13.6
1914	97,927,516	65,813,315	67.2	1,228,644	41.3	898,059	13.6
1913	96,512,407	63,200,625	65.5	1,147,039	38.6	890,848	14.1
1912	95,097,298	60,359,974	63.5	1,106,777	37.2	838,251	13.9
1911	93,682,189	59,183,071	63.2	1,106,734	37.2	839,284	14.2
1910	92,267,080	53,831,742	58.3	997,978	33.6	805,412	15.0
1909	90,691,354	50,870,518	56.1	765,738	25.7	732,538	14.4
1908	89,073,360	46,789,913	52.5	725,117	24.4	691,574	14.8
1907	87,455,366	43,016,990	49.2	603,151	20.3	687,034	16.0
1906	85,837,372	41,983,419	48.9	603,066	20.3	658,105	15.7
1905	84,219,378	34,052,201	40.4	212,744	7.2	545,533	16.0
1904	82,601,384	33,345,163	40.4	212,744	7.2	551,354	16.5
1903	80,983,390	32,701,083	40.4	212,762	7.2	524,415	16.0
1902	79,365,396	32,029,815	40.4	212,762	7.2	508,640	15.9
1901	77,747,402	31,370,952	40.3	212,770	7.2	518,207	16.5
1900	75,994,575	30,765,618	40.5	212,621	7.1	539,939	17.6
1900[2]....		28,807,269	37.9	176,878	5.9	512,669	17.8
1890[2]....	62,947,714	19,659,440	31.2	90,695	3.0	386,212	19.6
1880[2]....	50,155,783	8,538,366	17.0	16,481	0.6	169,453	19.8

[1] Exclusive of stillbirths.
[2] Census year ending May 31.

CAUSE OF DEATH

	Death Rate Per 100,000 Estimated Population in the Registration Area in Continental United States							
	1920	1921	1922	1923	1924	1925	1926	1927
All causes (exclusive of stillbirths)	1,306.0	1,163.9	1,181.7	1,230.1	1,183.5	1,182.3	1,222.7	1,141.9
Typhoid and paratyphoid fever	7.8	9.0	7.5	6.8	6.7	8.0	6.5	5.5
Malaria	3.6	3,6	3.6	2.8	2.5	2.1	1.9	2.7
Smallpox	0.6	0.7	0.7	0.1	0.9	0.7	0.4	0.1
Measles	8.8	4.3	4.3	10.8	8.6	2.3	8.2	4.1
Scarlet fever	4.6	5.3	3.5	3.5	3.1	2.7	2.5	2.3
Whooping cough	12.5	9.1	5.6	9.7	8.3	6.7	8.9	6.9
Diphtheria	15.3	17.7	14.6	12.1	9.4	7.8	7.5	7.8
Influenza and pneumonia	153.7	60.4	88.3	106.0	76.8	84.5	99.3	69.4
Erysipelas	3.1	2.8	2.5	2.7	2.5	2.4	2.5	2.4
Meningococcus meningitis	1.6	1.5	1.0	1.1	1.0	1.1	1.3	1.6
Tuberculosis of the respiratory system and acute disseminated tuberculosis	100.8	87.6	86.3	83.5	80.2	77.1	77.8	72.5
Other forms of tuberculosis	13.4	11.8	10.7	10.0	10.2	9.5	9.3	8.3
Cancer and other malignant tumors	83.4	86.0	86.8	89.4	91.9	92.6	94.9	95.6
Diabetes mellitus	16.1	16.8	18.4	17.9	16.6	16.9	18.0	17.5
Cerebral hemorrhage and softening, embolism and thrombosis (not cerebral)	86.4	85.1	87.7	92.2	94.4	86.5	88.9	87.3
Diseases of the heart	159.3	157.1	165.7	175.3	178.1	185.5	199.1	195.7
Bronchitis and broncho-pneumonia	67.9	48.3	54.6	56.7	48.2	45.1	50.5	39.2
Diarrhea and enteritis [1]	54.4	51.6	39.5	39.9	34.8	39.3	33.6	27.6
Appendicitis and typhlitis	13.4	14.4	14.2	14.8	14.9	15.1	15.0	15.0
Hernia, intestinal obstruction [2]	10.6	10.7	10.6	10.5	10.6	10.8	11.2	10.4
Cirrhosis of the liver	7.1	7.4	7.5	7.2	7.4	7.3	7.2	7.5
Acute and chronic nephritis	89.4	85.4	88.5	90.1	89.6	96.3	98.3	92.5
Puerperal septicemia	6.6	6.8	5.7	5.8	5.8	5.5	5.2	5.3
Other puerperal causes	12.6	10.1	10.0	9.8	9.7	9.3	9.1	8.4
Congenital malformations and diseases of early infancy	84.9	84.4	78.2	78.0	78.3	73.9	71.5	67.7
Suicide	10.2	12.6	11.9	11.6	12.2	12.1	12.8	13.3
Homicide	7.1	8.5	8.4	8.1	8.5	8.6	8.8	8.7
Automobile accidents [3]	10.4	11.5	12.5	14.9	15.7	17.0	17.9	19.5
Other external causes	61.0	57.2	57.5	61.5	60.7	61.3	60.7	58.9
Unknown or ill-defined diseases	17.7	16.0	17.7	17.2	17.7	17.4	17.8	17.6

[1] From 1900 to 1920 includes ulcer of the duodenum.
[2] From 1909 to 1920 includes adhesions of intestines.
[3] Excluding deaths from collission with railroad trains and street cars.

COGNATE SOCIETIES

ALLIANCE AGAINST FOOD FRAUD.—300 Madison Ave., New York, N. Y.

ALLIED DENTAL COUNCIL.—425 Lafayette St., New York, N. Y.

AMERICAN ACADEMY OF APPLIED DENTAL SCIENCES.—587 Fifth Ave., New York, N. Y.

AMERICAN ASSOCIATION FOR MEDICAL PROGRESS.—370 Seventh Ave., New York, N. Y.

AMERICAN COLLEGE OF SURGEONS.—40 E. Erie St., Chicago, Ill.

AMERICAN GYNECOLOGICAL SOCIETY.—104 S. Michigan Ave., Chicago, Ill.

AMERICAN HEART ASSOCIATION, INC.—370 Seventh Ave., New York, N. Y.

AMERICAN INSTITUTE OF HOMEOPATHY.—22 E. Washington St., Chicago, Ill.

AMERICAN LARYNGOLOGICAL ASSOCIATION.—1811 Spruce St., Philadelphia, Pa.

AMERICAN LARYNGOLOGICAL, RHINOLOGICAL AND OTOLOGICAL SOCIETY, INC.—145 W. 58th St., New York, N. Y.

AMERICAN MEDICAL ASSOCIATION.—17 W. 43rd St., New York, N. Y.

AMERICAN OCCUPATIONAL THERAPY ASSOCIATION.—370 Seventh Ave., New York, N. Y.

AMERICAN OPHTHALMOLOGICAL SOCIETY.—1819 Chestnut St., Philadelphia, Pa.

AMERICAN OSTEOPATHIC ASSOCIATION.—400 S. State St., Chicago, Ill.

AMERICAN PHYSIOLOGICAL SOCIETY.—Rockefeller Institute, New York, N. Y.

AMERICAN PUBLIC HEALTH ASSOCIATION.—370 Seventh Avenue, New York, N. Y.

AMERICAN SOCIETY FOR THE CONTROL OF CANCER.—370 Seventh Ave., New York, N. Y.

AMERICAN SOCIETY OF CLINICAL PATHOLOGISTS.—Children's Hospital, Denver, Col.

AMERICAN VETERINARY MEDICAL ASSOCIATION.—785 Book Building, Detroit, Mich.

ASSOCIATION OF MEDICAL COLLEGES.—3431 Lexington St., Chicago, Ill.

ASSOCIATION OF MILITARY SURGEONS OF THE UNITED STATES.—Army Medical Museum, Washington, D. C.

AMERICAN SOCIETY OF TROPICAL MEDICINE.—Box 131, Pennsylvania Ave. Station, Washington, D. C.

FRIENDS OF MEDICAL PROGRESS, INC.—234 Berkeley St., Boston, Mass.

GORGAS MEMORIAL INSTITUTE.—1598 Madison Ave., New York, N. Y.

NARCOTIC DRUG CONTROL LEAGUE, INC.—40 Wall St., New York, N. Y.

NATIONAL LEAGUE FOR NURSING EDUCATION.—370 Seventh Ave., New York, N. Y.

NATIONAL TUBERCULOSIS ASSOCIATION.—370 Seventh Ave., New York, N. Y.

NEW YORK ACADEMY OF MEDICINE.—17 W. 43rd St., New York, N. Y.

NEW YORK ACADEMY OF SCIENCES.—77th St. and Central Park West, New York, N. Y.

OSTEOPATHIC AID ASSOCIATION.—103 Park Ave., New York, N. Y.

PUBLIC HEALTH COMMITTEE, 17 W. 43rd St., New York, N. Y.

SOCIETY OF AMERICAN BACTERIOLOGISTS.—Cornell University, Ithaca, N. Y.

SOCIETY OF MEDICAL JURISPRUDENCE.—17 W. 43rd St., New York, N. Y.

SOUTHERN MEDICAL ASSOCIATION.—Empire Bldg., Birmingham, Ala.

UNITED BOARD OF HEALTH CONTROL, INC.—233 Broadway, New York, N. Y.

UNITED HOSPITAL FUND.—105 E. 22nd St., New York, N. Y.

UNITED STATES HAY FEVER ASSSOCIATION.—Bethlehem, N. H.

DIVISION XXIV

PHILOSOPHICAL AND SOCIAL SCIENCES

PHILOSOPHY

By A. A. Roback

University Extension Lecturer, Commonwealth of Massachusetts

NEW PUBLICATIONS

The year 1928 has not been an outstanding one in the annals of American philosophy. Neither in quantity nor in quality has the output reached distinction. The periodic producers have probably something "in press" or at least in preparation, but the close of the year has found them still in the trough of the publication wave.

Bertrand Russell.—Of course, one exception must be made of Bertrand Russell who always writes enough articles during the year to fill a volume; and this year his *Sceptical Essays* (256 pp.), which we may regard as an American publication (just as we are growing accustomed to take its author for an American philosopher), along with W. E. Hocking's book (which will be referred to later), represented the major English-speaking contemporary philosophers. The usual change in outlook, even though slight in this case, is to be found in this recent work. There is a more saturated tinge of scepticism underlying the whole collection, but the steady fight against dogmatism is carried on here with the same vigor, although perhaps in less emphatic terms than in earlier books. The formulation of the principles of scepticism and suggestions for a philosophical *modus vivendi* are probably the most useful sections of the volume.

H. O. Taylor.—A book of philosophical essays revealing a more cultural mental outlook is H. O. Taylor's *Human Values and Verities* (XIV, 282 pp.; Macmillan), presenting, in the mellow and humanistic style characteristic of the author, a series of what the Germans would call *Bekenntnisse.* The chapter on the author's religious ideals is the most revelatory part of the volume.

Books for the Layman.—Since the *Story of Philosophy* has sold both itself and philosophy, the line of (not always successful) successors seems to be unbroken. Thus Mrs. L. A. Beck (E. Barrington) has written *The Story of Oriental Philosophy* (VIII, 429 pp.; Cosmopolitan Book Corp.) which, of course, is not to be mistaken for a history of Oriental thought. One of the best introductions to philosophy in recent years is H. A. Larrabee's readable little volume *What Philosophy Is* (XII, 204 pp., Vanguard).

An introduction to philosophy of a different sort, in which the idealistic overtone is more audible than the realistic fundamental, is E. G. Spaulding's *What Am I?* (VII, 273 pp., Scribner's). Of interest to the layman are also two books on the authority of science almost diagonally opposed to each other. These are W. K. Wallace's *The Scientific World View* (IX, 316 pp., Macmillan) in which science is enthroned, and C. E. Ayres' *Science: The False Messiah* (296 pp., Bobbs-Merrill), in which the authority, dignity and promise of science are questioned in no uncertain terms, with the implication that it is almost comparable to tradition and folklore in its cogency.

SELECTIONS

Plato and Schopenhauer.—Perhaps it is symbolic for 1928 that it should retail the philosophy of the past in the form of selections, and it is a curious coincidence that fragments of Plato and Schopenhauer should have been brought out by two different publishers, and naturally by two different pairs of editors. *The Works of Plato*, by I. Edman (XLVII, 555 pp.; Simon and Schuster), *Plato's Selections*, by R. Demos (XXXVIII, 448 pp.; Scribner's), *The Works of Schopenhauer*, by W. Durant (XX, 539 pp.; Simon and Schuster), *Schopenhauer's Selections*, by De Witt H. Parker (XXXII, 447 pp.; Scribner's). It is strange that Schopenhauer should enjoy such a wide popularity as to be served out, without the provocation of an anniversary, by no fewer than three editors *in one year*, for in addition to Parker's and Durant's compilations, we have also Edman's *The Philosophy of Schopenhauer* (XIV, 376 pp., Modern Library). These, together with the earlier volume of selections from *Spinoza's Works* by J. Ratner, are only the beginning of a whole series of fragments, but it is to be hoped that the duplication will not run throughout the series.

Anthologies.—An anthology of John Dewey's philosophy by J. Ratner has just appeared under the title of *The Philosophy of John Dewey* (XII, 560 pp., Holt). The growing interest in contemporary philosophy is indicated by the publication of D. S. Robinson's *An Anthology of Recent Philosophers* (680 pp., Crowell), a compilation which well supplements Rand's *Classical Philosophers* and which is excellently conceived and planned but falls short in its comparative dearth of foreign material. Are we to understand that the "greatest 20th century philosophers" write exclusively in English, just as it was thought by the zealots of each nation that the angels spoke Hebrew, Latin, French or English, according to the language the former used themselves? By far the majority of writers represented in this volume are American.

THE FOREIGN INFLUENCE

Perhaps this is a sign of the times, an indication that America is asserting itself in philosophy and is prepared to show that nearly a whole anthology can be filled with United States products, in spite of the customary German sneer. Nevertheless, it must not be inferred that there is any danger of European philosophy being neglected in this country. In fact, there is a greater eagerness to become acquainted with recent foreign movements and doctrines in America than in England. It may be pointed out, *e.g.*, that the collaboration by a number of foreign authors of the volume *Philosophy To-day*, edited by E. L. Schaub (X, 609 pp., Open Court) is a valuable presentation of the status of philosophy and its recent developments in England, France, Germany, Russia, Scandinavia and South America. Nevertheless, the volume is not representative of contemporary philosophy in that it is not comprehensive, and does not give the impression that a work presenting a survey of philosophy in the various cultural countries has originally been planned. At the same time the *Philosophical Review* (Nov.) has printed comprehensive accounts both of German and French contemporary philosophy. When we come to survey the contributions to the different fields, we find that, although there is scarcely a compartment which has not received some attention, the offerings in any one branch are few.

HISTORY OF PHILOSOPHY

Outstanding Books.—In the history of philosophy, we may count the new volumes on the fingers of one hand. There is R. McKeon's carefully systematized study of Spinoza, *The Philosophy of Spinoza* (IX, 345 pp., Longmans, Green); one of the most erudite works on Spinoza in recent years. The bibliography is very comprehensive, but contains a number of slips and misprints. R. Scoon's *Greek Philosophy before Plato* (VIII, 351 pp., Princeton University Press); J. L. Connolly's *John Gerson, Reformer and Mystic* (XVIII, 408 pp., Herder), a thorough exposition of the cele-

brated scholastic written from a Roman Catholic point of view, and finally we must mention the two volume translation of Roger Bacon's *Opus Majus*, by R. B. Burke (XIII, 840 pp., University of Pennsylvania Press), an accomplishment of no mean value.

It is interesting to note that J. Shatzky's *Spinoza un zein Sviveh* (Spinoza and His Environment), which appeared in New York in Yiddish toward the end of 1927, saw a new edition in less than a year. This scholarly work, which contains an extensive polyglot bibliography of *Spinoziana*, is now being translated into English.

The only textbook published during the year on the history of philosophy is by that prolific popular writer, H. W. Dresser, whose *History of Modern Philosophy* (XIV, 471 pp., Crowell) is an expansion of part of an earlier volume.

METAPHYSICS

Carr and Turner.—The decline of interest in metaphysics steadily goes on. For a volume which treats of topics along such lines we must turn to the work of the Englishman, H. Wildon Carr, *The Unique Status of Man*, which contains the lectures delivered by the author in 1927 at the University of Southern California on the New Era Foundation. In this book are to be found discussions on freedom, emergent evolution, individuality and monadic philosophy. Another Englishman, J. E. Turner, has published a paper on "The Character of Reality" in *The Monist* (April), while the Russian philosopher, S. Frank, in the same journal (July) has taken up the age-old question of the "Problem of Reality," the solution of which, he believes, lies not in the contemplation of external objects so much as in directing our gaze inward.

Hocking.—Metaphysical topics form the subject-matter of W. E. Hocking's little book, *The Self, Its Body and Freedom* (IX, 198 pp., Yale Univ. Press). Here the author crosses swords with behaviorism and other mechanistic tendencies in contemporary philosophy and psychology. The volume is distinguished for its style and literary allusions.

Textbook.—Were it not for an occasional revival in the neo-scholastic camp, metaphysics would scarcely be mentioned in American philosophy except in an historical context. To be able, therefore, to point to a textbook on metaphysics such as J. F. McCormick's *Scholastica Metaphysica* (XIX, 253 pp., Loyola University Press) is, under the circumstances, refreshing.

EPISTEMOLOGY

The theory of knowledge hardly fares any better, but the fact that it is difficult to draw the line between epistemology and logic in recent books and articles makes it possible for the former to keep its head above water. J. S. Moore's *Rifts in the Universe: A Study of the Historic Dichotomies and Modalities of Being* (XV, 330 pp., Yale University Press, 1927) may be described as an epistemological approach to the concepts of metaphysics. *The Problem of Truth* (263 pp., University of California Press) is the title of a symposium on the fundamentals of the theory of knowledge by members of the Department of Philosophy at the University of California. Whether D. Luther Evans' *New Realism and Old Reality* (VII, 214 pp., Princeton University Press) is to be classed as epistemology is less certain than in the foregoing cases; at any rate, it is a vigorous though not sufficiently searching or penetrating critique of the now almost disintegrated American movement.

RELIGION

The philosophy of religion has not kept pace even with the fields of philosophy mentioned above. Books on religion were, of course, published during the year in scores, if not in hundreds, many of them not worth the paper they are printed on, but works on the philosophy of religion are scarce. E. W. Lyman's *The Meaning of Selfhood and Faith in Immortality* (47 pp., Harvard University Press), which constituted the Ingersoll Lecture for 1928, is one of the very few that should be recorded.

C. Rahn's *Science and the Religious Life: A Psycho-Physiological Approach* (VII, 221 pp., Yale Univ. Press) is, as far as I can make out, an attempt to show that religion is imbedded in our very naturalistic framework, but whatever the message this semi-literary book contains, it is ineffectual if not entirely lost in the mass of rambling irrelevancies. There are, to be sure, philosophical books with a religious coloring, but for the most part, they belong to ethics, *e.g.*, E. A. Brightman's *A Philosophy of Ideals* (VII, 243 pp., Holt).

Perhaps the outstanding event in this sphere was the controversy between the two able polemists, D. S. Miller and F. C. S. Schiller (*Journal of Philosophy*, March 15) over the interpretation to be accorded the empiricism of William James. The dispute had arisen over Schiller's review of Bixler's recent book on the religious philosophy of James. The forgotten feud between the idealistically-inclined Miller and the humanistic Schiller has blazed forth anew (and not only with rhyme but with reason as well).

ETHICS

The situation is more encouraging in the field of ethics, in that at least half a dozen sizeable volumes have been published on this subject by American authors, the most outstanding contribution being R. C. Lodge's *Plato's Theory of Ethics, The Moral Criterion and the Highest Good* (XIV, 558 pp., Harcourt Brace, International Library). Although, perhaps, rather a contribution in the strict sense to the history of philosophy, the work offers an examination of ethical theory in general. F. C. Sharp's *Ethics* (VI, 566 pp., Century) is a textbook for students along traditional lines, but with a good deal of elaboration of special problems. A well-documented work and deriving much of its material from concrete situations and literary sources, it is likely to supersede even such a standard text as Dewey and Tufts' *Ethics*.

As an introduction to ethics for the educated layman, D. Drake's *The New Morality* (XII, 359 pp., Macmillan) has much to commend it, even though the title is somewhat misleading, deriving its sanction, probably, from the long series of expositions of "new" sciences coming out almost at monthly intervals. A personalistic treatment of ethics is to be found in E. A. Brightman's *A Philosophy of Ideals* (VII, 243 pp., Holt). Finally, we may allude to E. B. Copeland's *Natural Conduct* (Stanford University Press).

OTHER PHILOSOPHICAL PUBLICATIONS

Philosophy of the State.—In social and political philosophy, it is possible to enumerate a long list of works, if more stress is laid on the "social" than on the "philosophy." But to restrict ourselves we ought to take under consideration B. C. Rodick's monograph *The Doctrine of Necessity in International Law* (IX, 195 pp., Columbia University Press), and J. A. Nicholson's monograph, *Some Aspects of the Philosophy of L. T. Hobhouse, Logic and Social Theory* (82 pp., University of Illinois). The biological phase of social philosophy is taken up by W. M. Wheeler in his booklet *Emergent Evolution and the Development of Societies* (80 pp., Norton). In this more or less inclusive category must be placed J. L. Leighton's *Individuality of Education* (XI, 204 pp., Appleton), which outlines a philosophy of education in accord with the requirements of modern democracy.

Logic.—There has not been the same vigorous advance in logic during 1928 as during 1927. The most important work in this discipline is E. A. Burtt's *Principles and Problems of Right Thinking* (XII, 590 pp., Harper's) which, although designed as a textbook, may also be regarded as a treatise because of its solid material and somewhat different approach to the various topics from that of the usual text. B. B. Bogoslovsky's *The Technique of Controversy. Principles of Dynamic Logic* (XIII, 266 pp., Harcourt Brace, International Library) is a rather suggestive piece of work, linking up logic with psychology. Written in a more popular

strain and with considerable literary polish is Abbé E. Dimnet's *The Art of Thinking* (XII, 216 pp., Simon & Schuster). It is helpful and stimulating, even if it cannot pretend to make any theoretical contribution.

Pragmatism.—As for schools of philosophy, it is impossible to say that any one of them has made an appreciable gain. Nevertheless, Pragmatism, although by many relegated to the historical museum, has awakened a fresh interest in various quarters. The purely *epistemological* stand of pragmatism has been ably defended in two articles by C. W. Morris: "Neo-Pragmatism and the Ways of Knowing" and "The Prediction Theory of Truth" (*Monist*); while H. N. Wieman has argued for a sort of pragmatic religion in *The Wrestle of Religion with Truth* (253 pp., Macmillan, 1927). Perhaps, however, it would be safer to say that the point of view in this book is a cross between Pragmatism and Relativity in Whitehead's sense. The political phase of Pragmatism has been given expression in a solid work by W. Y. Elliott, entitled *The Pragmatic Revolt in Politics, Syndicalism, Fascism, and the Constitutional State* (XVII, 540 pp.).

Josiah Royce.—If Pragmatism has had its share of recognition during the past year or so, it is well to remember that abroad the very foe of James's philosophy, Josiah Royce, has been receiving lately an unusual amount of attention. Within the last two years, two doctoral dissertations on Royce's philosophy have appeared respectively in French and German; the one by M. J. Aronson, *La Philosophie Morale de Josiah Royce—Essai sur l'Idéalisme Social aux Etats-Unis d'Amérique* (XV, 185 pp., Alcan, 1927) was composed at the Sorbonne, while W. Rothman's *Josiah Royce's Versuch einer Synthese von Pragmatism und Objektivität* (75 pp., Jena, 1926) was written under the guidance of Professor Bauch. Hitherto, Royce's philosophy had struck a favorable soil only in Italy, where two of his best-known works have been translated. The fact that American students are eager to specialize in Royce's philosophy, and professors in universities abroad are willing to accept dissertations embodying such research, is evidence that Royce's name is not in any danger of being consigned to oblivion.

AMERICAN PHILOSOPHICAL ASSOCIATION

The Eastern Division of the American Philosophical Association met this year at the University of Pennsylvania, December 27-29. The program contained papers by E. A. Singer "On a Definition of Consciousness"; by C. L. Barrett on the "Social Meaning and the Concept of Society"; by P. E. Wheelwright on "A Metaphysic of Literary Criticism"; by M. R. Cohen on "The Creative Imagination"; by P. Weiss on "Alternative Systems of Logic"; by H. R. Smart on the question, "Is Mathematics a Deductive Science?"; by D. C. Macintosh on "The Next Step in the Epistemological Dialectic"; and "A Reexamination of Critical Realism" by R. W. Sellars.

An interesting symposium was scheduled on the topic "In What Sense and to What Extent Does Religious Experience Afford Knowledge?", in which J. B. Pratt, A. N. Whitehead, J. H. Leuba and E. S. Brightman participated. A discussion between E. A. Spaulding and W. H. Sheldon on the topic, "Are There Any Necessary Truths" closed the meeting. The presidential address by Felix Adler on *The Ethical Problem* was looked forward to by many of the younger members, especially, as a fitting sequel to Hocking's eloquent address last year in which the plea was made that the world is full of meanings and the incentive to find them is the call of reality itself.

CARNEGIE CORPORATION ENDOWMENT

Thanks to a gift of $100,000 by the Carnegie Corporation of New York, the American Philosophical Association will be enabled to publish a series of source books in the History of the Sciences, presenting the most important contributions from the fifteenth century to the present time, at the rate of about a volume a year.

The series is under the general editorship of G. D. Walcott of Hamline University, but the coöperating board of editors includes W. H. Sheldon of Yale University, W. P. Montague of Columbia University, M. R. Cohen of the College of the City of New York, E. G. Spaulding of Princeton University, A. O. Lovejoy of Johns Hopkins University, G. H. Mead of the University of Chicago and H. C. Brown of Stanford University.

LECTURESHIPS

John Dewey has accepted an invittaion to deliver the Gifford Lectures at the University of Edinburgh in 1929. The last incumbent of this Lectureship was A. N. Whitehead. F. C. S. Schiller of Corpus Christi College, Oxford, is visiting professor for the second semester of the present academic year at the University of California at Los Angeles. Other visiting professors at the same university are J. E. Boodin of Carleton College and J. A. Leighton of Ohio State University. At the University of California in Berkeley, E. B. McGilvary, of the University of Wisconsin, will be lecturing on the Mills Foundation.

OBITUARY

On July 26, there occurred the death, at the age of 71, of G. M. Duncan, for twenty years Professor of Logic and Metaphysics at Yale University. The deceased, who had been *emeritus* for some years, was the author of *The Philosophical Works of Leibniz*, and of a number of articles in philosophical journals.

PSYCHOLOGY

By Wilbur S. Hulin

Professor, Princeton University

ORGANIZATIONS AND MEETINGS

American Psychological Association.—Scientific psychology in America consists very largely of the work done by the members of the American Psychological Association. In 1928, this Association increased its enrollment to a total of 699 members, most of whom are professionally active in academic or medical pursuits. For the current year the President of the Association is Professor E. G. Boring of Harvard University. At the annual meeting of the Association held at Columbia University in December, Professor Boring delivered a sparkling address on "The Psychology of Controversy."

The National Educational Association held its general session at Minneapolis with a registration which exceeded 10,000 visitors including 1,152 delegates. The president is Cornelia S. Adair.

National Research Council.—An important conference of 32 eminent psychologists, held in March at Dickinson College under the auspices of the National Research Council, attempted to formulate definite problems and to organize coöperative programs of research whereby greater efficiency could be obtained in the work of discovering psychological facts.

Ninth International Congress.—Another national committee of American psychologists have been busy with the preparations for the Ninth International Congress of Psychology to which America will act as host for the first time. The Congress will meet at Yale University in September, 1929. Professor J. McK. Cattell is the President of the National Committee.

The Psychological Index has shown an increase in 1928 over the total of 5,798 titles of books and articles in all languages on psychology published in 1927. American psychologists annually contribute over one-third of these publications.

CURRENT PUBLICATIONS

Titchener.—Items of current interest have included Frank Angell's reminiscences of "Titchener at Leipzig" (*Jour. Gen. Psych.*, April, 1928).

Copies of a motion picture "Titchener Film" may be obtained from Prof. W. S. Miles at Stanford University. The late Professor Titchener's chair of psychology at Cornell is now held by Professor I. M. Bentley, formerly of the University of Illinois. Under Prof. Bentley's influence, an interest in functional psychology is being added to the Titchenerian interest of structural psychology at Cornell.

Necrology and Laboratories.—E. G. Boring has compiled a helpful "Psychological Necrology" for the years 1903-1927 (*Psych. Bull.*, May and Oct., 1928). J. McK. Cattell has described the "Early Psychological Laboratories," including a discussion of the early American laboratories at the University of Pennsylvania, etc. (*Science*, June, 1928).

Washburn Commemoration. — A special volume of the *American Journal of Psychology* was published as a "Washburn Commemorative Volume" being dedicated to Professor Margaret Floy Washburn of Vassar College who is now actively engaged in her thirty-fourth year of "distinguished service to psychology." Thirty-four leading psychologists have contributed papers, including an "Outline of a Psychological Standpoint" by H. C. Warren, "Washburn's Motor Theory," by T. M. Abel, "Apparent Visual Movement with Stationary Stimulus," by H. S. Langfeld, "What Is Native in the So-Called Instincts?" by W. B. Pillsbury, "Locomotion and Righting Movements in Echinoderms," by G. H. Parker, etc.

BEHAVIORISTIC PSYCHOLOGY

Behavioristic psychology has continued its course as a popular expression of the modern biological viewpoint of the majority of American psychologists. J. B. Watson has brought forth yet another book on his favorite subject, promising that this volume is of interest "to everyone": *The Ways of Behaviorism* (Harper & Bros., 1928). Among the other outstanding behavioristic productions of the year, R. C. Travis and R. Dodge have compiled their elaborate "Experimental Analysis of the Sensori-Motor Consequences of Passive Oscillation, Rotary and Rectilinear" and have shown that the general bodily kinæsthesis is more important than vestibular sensations in the perceptions of orientation (*Psych. Rev. Monog.*, no. 175, 1928).

F. Akroyd, in "Some Tests and Correlations of Hand-Eye Coördinations," has concluded that we are justified in speaking of motor *abilities* but not of *a* motor *ability* (*Forens. Educ.*, 1928). A very useful "History of the Experimental Study of the Knee-Jerk" has been written by F. Fearing (*Amer. Jour. Psych.*, Jan., 1928); also, H. Schlosberg has established carefully determined standards and experimental settings for eliciting the human knee-jerk,—"A Study of the Conditioned Patellar Reflex" (*Jour. Exper. Psych.*, Dec., 1928). C. N. Rexroad has shown some significant relations between "Eye-Movements and Visual After-Images" (*Amer. Jour. Psych.*, July, 1928). M. A. Tinker has made a "Photographic Study of Eye Movements in Reading Formulæ" (*Genetic Psych. Monog.*, Jan.-June, 1928).

CONFIGURATIONISM

Configuration, or *Gestalt-Psychologie*, has rapidly grown in importance with American psychologists since the theory was introduced especially through the personal visits of the German leaders of the original school. The one leader, K. Koffka, is now a professor at Smith College, and the other leader, W. Köhler, promises to return to America in 1929. H. H. Hsiao has made "A Suggestive Review of Gestalt Psychology" which brings to date and clarifies much of the work done in terms of this school of theory (*Psych. Rev.*, July, 1928). H. G. Wyatt has criticized the school in his article, "The Gestalt Enigma" (*ibid.*, July, 1928); and R. M. Ogden has defended the school in his article, "The Gestalt-Hypothesis" (*ibid.*, March, 1928).

GENERAL STUDIES

These books have included several theoretical discussions such as the speculative treatise by L. T. Troland on *Human Motivation* (Van Nos-

trand, 1928). In answer to the question, "How Shall We Use the Term 'Mind'?" H. T. Manuel has said that we should either use the term to refer to the organic basis of mental activity or we should not use the term at all (*Jour. Gen. Psych.*, April, 1928). H. C. Sanborn discussing "Methodology and Psychology" has argued that there is no absolutely valid or completely adequate method in psychology, but that all the methods are only relative in their usefulness (*Phil. Rev.*, Jan., 1928). W. Wickham has made a popularized criticism of the viewpoints of Watson, McDougall, Freud and others in his book, *The Misbehaviorists* (Dial, 1928).

Among the general textbooks, A. I. Gates has enlarged his book on educational psychology into a more inclusive *Elementary Psychology* (Macmillan, 1928). H. P. Weld has contributed a book which fulfills the keenly felt need of an elementary discussion and summary of the general theories and systems of psychology: *Psychology as Science: Its Problems and Points of View* (Holt, 1928). C. A. Ruckmick has surveyed modern experimental psychology in his *Mental Life* (Longmans, Green, 1928). J. F. Dashiell has produced a very superior general text in his *Fundamentals of Objective Psychology* (Houghton, Mifflin, 1928). W. S. Hunter's new book on *Human Behavior* has been a complete revision of his earlier textbook, and all the former discussions of conscious processes are re-stated in the objective terms of a strictly behavioristic point of view (Univ. Chicago Press, 1928).

PSYCHOPHYSICS AND SENSORY PSYCHOLOGY

Studies and Experiments.—E. G. Wever and K. E. Zener have devised a new experimental procedure called "The Method of Absolute Judgment" and they have demonstrated its utility in the field of lifted weight judgments (*Psych. Rev.*, Nov., 1928). S. C. Dodd has made a careful examination into the statistical methods and theories, especially those used by Pearson and Spearman, in his evaluation of "The Theory of Factors" (*ibid.*, May and July, 1928). In the field of vision, G. J. Rich has sought to combine the Hering and Ladd-Franklin theories of color vision into what Rich calls "An Eclectic Theory of Vision" (*ibid.*, July, 1928). E. G. Wever has studied "The Effect of a Secondary Sound upon Hearing" and has found that a background of tone always reduces the acuity of hearing for other sounds (*Science*, June, 1928). Also in audition, C. C. Pratt has furnished an interesting test of the Weber-Fechner Law in his experimental finding that if an auditory "distance" larger than an octave be taken as a *musical interval* the midpoint of this interval will be judged near the geometric mean, but if taken as a given separation it is perceived at the arithmetic mean (*Jour. Exp. Psych.*, Jan., 1928). In the study of touch, V. O. Knudsen has made a thoroughgoing analysis of "Hearing with the Sense of Touch" by applying various stimuli to the skin such as vacuum tube oscillators generating frequencies from ten up to fifty thousand vibrations per second, but the tactual sense for pitch differences was found to be extremely limited, although the tactual interpretation of speech (as tested with telephone receivers on the skin) encountered less difficulty in being recognized (*Jour. Gen. Psych.*, April, 1928). In the olfactory sense department, H. R. Crosland found that a subject who had lost his sense of smell still possessed a normal sensitivity for taste sensations: "Oral Perceptions in Relation to Anosmia" (*Jour. Exp. Psych.*, April, 1928).

Perception.—P. T. Young has described his prolonged study of "Auditory Localization with Acoustical Transposition of the Ears" in which study each ear was attached to eartrumpets which crossed over the head to the opposite side so that the left ear more readily received sounds from the right side of the body. When blindfolded, the subject experienced a complete confusion, but with the eyes open he could learn to interpret the nature of the sound according to its actual objective location. W. S. Hulin has demonstrated

the similarity of results obtained with the two contrasting types of judgment, relative and absolute, in the study of lifted weights: "Two Comparison Stimuli with One Initial Standard in Lifted Weights" (*Amer. Jour. Psych.*, Oct., 1928). From his study on "The Effect of an Unexpected Heterogeneity on Attention," R. W. Wilcocks has suggested a theory in which attention represents an accumulation of energy in a limited psychophysical area with a consequent inhibition in incongruent areas (*Jour. Gen. Psych.*, April, 1928).

Emotion.—In affection, contrary to the James-Lange theory, the "Function of Emotion in Experience" has been claimed by G. M. Stratton to be one of increasing our adequacy rather than decreasing it (*Psych. Rev.*, Sept., 1928). L. Berman has produced a new edition of his popularized and dubious account of *The Glands Regulating Personality* (Macmillan, 1928). L. Witmer's Clinic at the University of Pennsylvania has continued the study of the rôle of hydrogen-ion concentration especially in relation to emotions, as is seen in H. E. Starr's article, "Psychological Concomitants of High Alveolar Carbon Dioxide" (*Psych. Clinic.*, March, 1928). M. Sherman has described the reason for the "Emotional Character of the Singing Voice" (*Jour. Exp. Psych.*, Dec., 1928).

Imagery and Memory.—In the experimental work on imagery and memory, G. W. Allport has made some further comparisons between "The Eidetic Image and the After-Image," showing that this remarkable type of imagery is very much like a bordering state of development to that of the positive after-image in vision (*Amer. Jour. Psych.*, July, 1928). C. W. Bray has shown through a very careful and voluminous study that practice in motor skill is transferred from the hand to the foot or to the other hand, and even to some degree from the foot to the hand: "Transfer of Learning" (*Jour. Exp. Psych.*, Dec., 1928). The usual conclusion that transfer of training only involves identical elements has been reaffirmed by L. W. Cole: "Interference Between Related Mental Processes" (*Jour. Educ. Research*, 1928).

PHYSIOLOGY

R. J. A. Berry has brought together a large volume of literature including nerve physiology and its applications to psychopathology and mental tests: *Brain and Mind, or the Nervous System of Man* (Macmillan, 1928). L. J. Pollock has shown that "Muscle Tone" may be produced by a stretch reflex as well as by nerve stimulation (*Jour. Amer. Med. Assoc.*, 1928). C. C. Bunch has shown a clinical case where the "Auditory Acuity after Removal of the Entire Right Cerebral Hemisphere" was approximately equal for the two ears and that none of the tones produced were inaudible in either ear (*ibid.*, 1928). E. R. Carpenter has described the symptoms of "Early Tumors of the Brain" which include headaches and nausea of unknown cause (*Med. Jour. and Rec.*, July, 1928). O. R. Longworthy has investigated "The Control of Posture by the Central Nervous System" (*Physiol. Rev.*, April, 1928). R. Dodge and J. C. Fox have examined the peculiarities of "Optic Nystagmus" in abnormal cases (*Arch. of Neur. and Psychiat.*, Nov., 1928).

PSYCHOPATHOLOGY

A collection of papers, entitled *The Unconscious: A Symposium*, has been prepared by the following contributors: C. M. Child, K. Koffka, J. E. Anderson, J. B. Watson, E. Sapir, W. I. Thomas, F. L. Wells, W. A. White and others (Knopf, 1928). The relation of "Delinquency and Disease" has been discussed by P. E. Rothman (*Jour. Delinquency*, March, 1928). The increasing prevalence of suicide makes "The Psychology of Suicide" a subject of importance, and W. R. Roalfe has shown how certain unconscious processes seem to be operative (*Jour. Abn. & Soc. Psych.*, 1928). A. H. Kamiat has discussed "The Cosmic Phantasy" as a compensation mechanism (*Psychoanal. Rev.*, April, 1928). C. Rosenow has argued that hypnotic behavior is not "dissociated," but is always directed to some end, as also is hysteria, although the

end may be unrecognized by the individual: "Meaningful Behavior in Hypnosis" (*Amer. Jour. Psych.*, April, 1928). A. Adler has outlined "The Cause and Prevention of Neuroses" in terms of one's general attitude toward life (*Jour. Abnorm. & Soc. Psych.*, April-June, 1928). W. F. Vaughan has attempted a Freudian treatment of sociology in his book, *The Lure of Superiority* (Holt, 1928).

C. Rahn, in his *Science and the Religious Life: A Psycho-Physiological Approach* has made a very worthy suggestion toward the coöperation of religion and science; he has stated the belief that there is no reason why science and the world views of science should not tap the same springs of hidden energy in man which have been utilized in the religious experiences of the race and the individual (Yale Univ. Press, 1928). A voluminous biographical and questionnaire study of youth has been prepared by D. Sudbury under the title, *Grown into Life: A Magna Charta of Youth* (Boni & Liveright, 1928). H. Hartshorne and M. A. May have compiled results both from genetic and statistical methods upon *Studies in Deceit* (Macmillan, 1928). W. Healy has summarized in a comprehensive manner "The Mental Factors in Crime" (*Ment. Hygiene*, Oct., 1928). O. Kleinberg in "An Experimental Study of Speed and Other Factors in 'Racial' Differences" has decided that white children are superior to negro and Indian children in speed but not in accuracy of performance tests, and that this is due to environmental rather than racial differences (*Arch. Psych.*, Jan., 1928). A résumé of the responses of 100 husbands on the question of "What Is Wrong with My Marriage" has been prepared by G. V. Hamilton and K. MacGowan (*Woman's Home Companion*, 1928). E. S. Bogardus has presented a factual and statistical study of racial attitudes which lie at the heart of race problems and conflicts: *Immigration and Race Attitudes* (Heath, 1928). The products and the value of the habit clinics along with case studies of 17 families has been discussed by W. C. Weill in *The Behavior of Young Children of the Same Family* (Harvard Univ. Press, 1928).

ANIMAL PSYCHOLOGY

C. E. Balfour and L. Carmichael have tested the extent of "The Light Reactions of the Meal Worm" (*Amer. Jour. Psych.*, Oct., 1928). N. Cameron has demonstrated important contradictory evidence to K. S. Lashley's assertion that the cerebral cortex in the rat is unimportant to its behavior; Cameron used more complicated mazes than Lashley and found the cortex was necessary: "Cerebral Destruction in Its Relation to Maze Learning" (*Psych. Rev. Monog.*, no. 177, 1928). G. L. Walls has shown that there is probably no pigment migration in "The Photochemical Changes in the Retina of Mammals" where a rapidly changing pupil has evolved to protect the retina (*Science*, June, 1928).

In reference to the question of heredity, F. H. Hankins has claimed that environment can produce no response not inherently possible for the organism: "Organic Plasticity *vs.* Organic Response" (*Soc. Forces*, 1928). In the popular subject of maze learning in animals, S. A. Cook has found that with simple mazes the practice may be massed more than in complicated mazes: "The Effects of Various Temporal Arrangements of Practice on the Mastery of an Animal Maze" (*Arch. Psych.*, April, 1928). P. T. Young has listed a useful set of "Precautions in Animal Experimentation" (*Psych. Bull.*, August, 1928). O. L. Tinklepaugh has entered upon the field of "Experimental Study of Representative Factors in Monkeys" (*Jour. Comp. Psych.*, June, 1928). Also, R. M. Yerkes and D. N. Yerkes have continued their studies on the anthropoids with a paper "Concerning Memory in the Chimpanzee" (*ibid.*, June, 1928).

EDUCATIONAL PSYCHOLOGY

In W. H. Pyle's new edition of *The Psychology of Learning*, chapters have been added on "Psychology of Special Subjects" and "A Theory of Learning" (Warwick & York, 1928). H. M. Johnson has reported on the

work done with the *Children in the Nursery School* of the Bureau of Educational Experiments where training of gross musculature replaces conventional and lingual training (New York: John Day, 1928). E. L. Thorndike and collaborators have summarized the experimental results on *Adult Learning* (Macmillan, 1928). E. A. Corwan has used the "Results of Motor Reconditioning Methods Used in Training a Backward Child" as a new pedagogical device (*Jour. Genetic. Psych.*, March, 1928). R. S. Ellis has brought together a rather general discussion of *The Psychology of Individual Differences* (Appleton, 1928). The educational application of *The Psychology of Abnormal People* has been handled by J. B. Morgan (Longmans, Green, 1928). A. M. Jordan has produced a good *Educational Psychology* textbook (Holt, 1928).

W. F. Dearborn has furnished another important contribution to the field of mental testing in the publication of his lectures on *Intelligence Tests: Their Significance for School and Society* (Houghton, Mifflin, 1928). P. Popenoe has offered support to the principle that sterilization must be applied to individuals because of their individual characteristics and inheritance rather than because of their inclusion in some particular socio-economic group: "Eugenic Sterilization in California" (*Jour. Applied Psych.*, June, 1928). The Bureau of Public Personnel Administration Staff (1928) has published an extensive list of "Proposed Tests" and a "Survey" on the intelligence and mental capacity of police officers. T. L. Kelley has made a thorough test of Spearman's statistical method in his volume, *Crossroads in the Mind of Man: A Study of Differentiable Mental Abilities* (Stanford Univ. Press, 1928). A. T. Poffenberger has experimentally shown that in "The Effects of Continuous Work upon Output and Feelings" a change in feelings does not necessarily alter one's output (*Jour. Applied Psych.*, Oct., 1928).

The type of work now in progress in the study of the feeble-minded in America is well illustrated by the "Outline of Research in Progress 1927-1928, Department of Research, Training School, Vineland, N. J." The following researches are being conducted at that School: (1) a differential standardization of the Ferguson form boards; (2) adaptive behavior of idiots; (3) types of mental retardation; (4) a survey of Mongolian traits; (5) measurement of progress in training; (6) disabilities following birth injury; (7) personal behavior score card as a means of objective estimation of social behavior; (8) the reliability of the Goodenough test; (9) the relation of physiognomy to the diagnosis of feeble-mindedness and normality; (10) relation of dental development to feeble-mindedness; (11) emotional instability; (12) specific reading ability; (13) congenital auditory aphasia complicated by amentia; (14) congenital auditory aphasia; (15) precocious puberty in a boy of six (*Tr. School Bull.*, 1928).

SOCIOLOGY

By Frank H. Hankins

Professor, Smith College

TRENDS TOWARD SPECIALIZATION

Division of Labor.—During recent years it has become increasingly evident that a sharper division of interest among those who call themselves and are called by others sociologists has been developing. In the first place, the large and rapidly diversifying field of social work has become more and more specialized, while the conviction has become more widespread among theoretical sociologists that an interest in social reform may corrupt scientific objectivity. The relations between sociologist and social worker is thus in some respects less close than it was. On the other hand a considerable number of sociologists

have become deeply interested in problems of personality adjustment and the correlations of individual behavior patterns with the types of social-organization tradition and situation. They have found the maladjusted individual the most fruitful field of research efforts. Thus the materials and experience of social case workers are valuable aids to them. While their viewpoint is shaped very largely by the recent developments in the fields of psychiatry and psychoanalysis, they approach the problems of individual adjustment from the standpoint of the social environment and its formative influences in shaping individual standards of value and reaction patterns. A notable study along this line is *The Child in America* by Wm. I. Thomas and Dorothy S. Thomas (N. Y., Knopf). This viewpoint is frequently dwelt on in Publications of the American Sociological Society, Vol. 22, 1928, "The Relation of the Individual to the Community."

Viewpoints in Research.—The trend toward specialization is also manifest in the increased tendency of sociologists to study society from the particular viewpoints of the social psychologist, the social biologist, the culturist, or community organization. It is also manifest in the development of such specialized fields as rural sociology, urban sociology, educational sociology and the sociology of religion. These specializations have been made necessary by the rapid growth of materials and are proving to be an invaluable advantage to research because they particularize problems and bring them within the range of feasible study by exact scientific methods. It is largely in consequence of this that statistical methods are being more extensively employed.

TEXTBOOKS

The year was notable for the unusual number of sociological college textbooks placed on the market. Two *Principles of Sociology* were brought out, one by Rudolph M. Binder of New York University (N. Y.: Prentice-Hall, 609 pp.), and the other by Frederic E. Lumley of Ohio State University (N. Y.: McGraw-Hill, 562 pp.). Ernest R. Groves of the University of North Carolina produced an *Introduction to Sociology* (N. Y.: Longmans, Green, 568 pp.), and F. H. Hankins of Smith College an *Introduction to the Study of Society* (N. Y.: Macmillan, 760 pp.). John M. Gillette revised his *Rural Sociology* (N. Y.: Macmillan, 574 pp.), Newell L. Sims produced a new work in the same field, *Elements of Rural Sociology* (N. Y.: Crowell, 698 pp.), and Nels Anderson and Eduard C. Lindeman brought out the first systematic text in the rapidly growing field of *Urban Sociology. An Introduction to the Study of Urban Communities* (N. Y.: Knopf, 414 pp.). Here may be mentioned also John Storck's *Man and Civilization. An Inquiry into the Bases of Contemporary Life* (N. Y.: Harcourt, Brace, 3rd rev. ed. 1927, 449 pp.). Another work of general inquiry was Joseph K. Folsom's *Culture and Social Progress* (N. Y.: Longmans, Green, 558 pp.).

Representative of studies in more specialized fields were: *The American Community in Action; Case Studies of American Communities*, by Jesse F. Steiner of the University of North Carolina (N. Y.: Holt, 392 pp.); and *Case Studies in Community Organization*, by Walter W. Pettit, Assistant Director of the New York School of Social Work (N. Y.: Century, 345 pp.). A work of unusual scholarship was Pitirim Sorokin's *Contemporary Sociological Theories* (N. Y.: Harper, 785 pp.). Two works dealing with the rapidly mounting interest in theories of cultural evolution were: *The Building of Cultures*, by Roland B. Dixon of Harvard University (N. Y.: Scribner's, 312 pp.) and *Cultural Change*, by F. Stuart Chapin of Minnesota University (N. Y.: Century, 394 pp.).

THE FAMILY

Disorganization. — The tendency toward what is called "family disorganization" which has resulted from the growth of modern industrialism, the steadily increasing emancipation of women, and the develop-

ment of urban conditions of life has given rise to a vast amount of discussion. Many newspapers publish a daily or weekly column of answers to letters of the love-lorn or those disappointed in marriage. The *Birth Control Review* publishes scores of letters from women who have already as many children as they can provide for and are threatened with more. Weekly and monthly journals of various grades and types contain discussions of all aspects of marriage and of the family. The pulpit continues to debate the rightfulness of divorce and the remarriage of the divorced. College and university curriculas give increasing attention to the status of women in modern society and the changes being wrought in sex, marital, and family *mores* by the new social forces of a scientific and mechanical age. Social workers find the problems of family adjustment an increasing field of activity. Latterly increased attention is being given to the whole field of sexual relations and adjustments.

Research in Familial Relations.—The Social Science Research Council appointed an Advisory Committee on Research in Familial Relations under the chairmanship of Dr. Clark Wissler. This committee held a conference at Detroit, December 14-16. A considerable number of interested persons were invited to present views on the following topics: the family as a social institution, home management, family management, family disintegration, women's activities outside the home, familial law, recreation, birth control, and family health.

Publications.—Among outstanding books of the year on the family were: *The Family in the Making: an Historical Sketch*, by Mary B. Messer (N. Y.: Putnam's, 359 pp.); *Motherhood and Its Enemies*, by Charlotte Haldane (N. Y.: Doubleday, Doran, 253 pp.); *Problems of the Family*, by Willystine Goodsell (N. Y.: Century, 474 pp.); *Birth Control and Eugenics in the Light of Fundamental Ethical Principles*, by Joseph F. Wagner (N. Y.: Author, 249 pp.); *Modern Youth and Marriage*, by Henry Neumann (N. Y.: Appleton, 148 pp.); *The Child and Society*, by Phyllis Blanchard (N. Y.: Longmans, Green, 369 pp.); *Living with Our Children*, by Lilian M. Gilbreth (N. Y.: Norton, 309 pp.); *American Marriage and Family Relationships*, by Wm. F. Ogburn and Ernest R. Groves (N. Y.: Holt, 497 pp.); *The Child in America*, by Wm. I. Thomas and Dorothy S. Thomas (N. Y.: Knopf); *Why We Misbehave*, by Samuel D. Schmalhausen (N. Y.: Macaulay, 313 pp.); *The Catholic Church and the Home*, by J. M. Gillis (N. Y.: Macmillan, 116 pp.); *Sexual Apathy and Coldness in Women*, by W. M. Gallichan (Boston: Stratford, 183 pp.); *Parents and Children*, by E. R. and G. H. Groves (Phila.: Lippincott, 196 pp.); *Family Life Today* (papers presented at a conference at Buffalo in celebration of the 57th anniversary of family social work in America), M. E. Rich (Ed.) (Boston: Houghton Mifflin, 244 pp.); *Problem Child at Home*, by M. B. Sayles (Commonwealth Fund); *The Marriage Crisis*, by E. R. Groves (N. Y.: Longmans, Green, 242 pp.).

THE NEGRO

Cultural Achievements.—The increasing interest in the cultural achievements and possibilities of the colored element in the American population was variously manifested. Recent years have witnessed an extraordinary migration of Negroes to northern industrial centers. This has given rise to many new problems of race relations, to the difficulties attending the influx of unprecedented numbers of darker skinned neighbors into urban communities, and to an increased volume of Negro contributions to American artistic and literary culture. Through the Commission on Church and Race Relations of the Federal Council of Churches, $4000 in prizes and various medals were distributed to sixteen colored men and women. These represented the Harmon Awards for Distinguished Achievement among Negroes. The fields of achievement included the fine arts, business, science, and education. Decisions for each field were rendered by a jury of five, on each of which were representative Negroes.

Publications.—Under the auspices of the Institute for Social and Religious Research, Professor T. J. Woofter completed a study of *Negro Problems in Cities*. Some other works of interest in this connection include: *Rainbow Round My Shoulder; The Blue Trail of Black Ulysses*, by Howard W. Odum (Indianapolis: Bobbs-Merrill); *Photo-Phonographic Studies of the Negro Voice*, by Milton Matfessel (Univ. of N. Car. Press); *Negro Business Studies*, by T. J. Woofter, Thomas Holland, and Roland B. Eutsler (Univ. N. Car. Press); *Leaders of the Colored Race in Alabama*, edited by T. H. Moorman and E. L. Barrett (Mobile News Pub. Co., 98 pp.); *The Negro in Contemporary Literature*, by Eliz. L. Green (Univ. of N. Car. Press, 98 pp.); Melville J. Herskovitz, *The American Negro: A Study in Race Crossing* (N. Y.: Knopf, 92 pp.); *Morality of the Color Line*, by F. J. Gilligan, (Catholic Univ. of Amer., 222 pp.); *Lives of Eminent Africans*, by G. A. Gollock, (N. Y.: Longmans, Green, 152 pp.).

SOCIOLOGICAL ORGANIZATIONS

American Sociological Society.—The twenty-second annual meeting of this society was held at Washington, December 27-30, 1927. For the first time in twelve years all the major social science bodies met at the same time and in the same city. Moreover, there were also held conjointly with them the annual sessions of various less notable bodies. The program of the Society centered about the topic, "The Relation of the Individual to the Group." The presidential address by William I. Thomas dealt with "The Behavior Patterns and the Situation." Special meetings were devoted to the following divisions of the society: social biology, social psychology, human ecology, social institutions, and methods of social research. Three round tables dealt respectively with the statistical, survey and case methods of social investigation. Sectional meetings were held for those interested in rural sociology, educational sociology, sociology and social work, the family, the community, and religion.

The membership of the society numbers 1140. The officers for 1928 were: John M. Gillette, president; F. H. Hankins, first vice-president; L. L. Bernard, second vice-president; E. W. Burgess, University of Chicago, secretary-treasurer. The twenty-third annual meeting was held at Chicago, December 26-29, 1928, the central topic being "The Rural Community." There were sessions for the divisions of social psychology, social research and human ecology and population, and teaching for all the sections above mentioned.

Social Science Research Council.—This body is composed of three representatives from each of seven learned societies in the fields of political science, sociology, economics, statistics, psychology, anthropology and history. It has established executive offices, with Robert S. Lynd as assistant to the chairman and John V. van Sickle as fellowship secretary, at 50 East 42d St., New York City. Its officers are: Wesley C. Mitchell of Columbia, president; Arthur M. Schlesinger of Harvard, vice-president; Robert T. Crane of Michigan, secretary; and Robert S. Woodworth of Columbia, treasurer. It has ten advisory committees on corporate relations, crime, cultural areas, grants-in-aid, industrial relations, international relations, interracial relations, pioneer belts, population, and agriculture, besides special committees on problems and policy, fellowships and abstracts. It promotes an annual conference on research at Hanover, N. H., during the summer, at which are assembled the members of its ten advisory and other committees. Through its committee on Scientific Method in the Social Sciences it has encouraged the preparation of a casebook on methods. The chairman of this committee is Professor Horace Secrist of Northwestern University, while Professors Stuart A. Rice of Pennsylvania and R. M. MacIver of Columbia have been commissioned to prepare the casebook.

The Council also grants research fellowships of substantial amount to young scholars, primarily for the purpose of developing expert research

workers, but secondarily to promote the completion of research projects. In addition it gives small grants to aid the completion of promising studies. Another important activity has been the advancement to realization of plans for a *Journal of Abstracts in the Social Sciences*. The Council secured in 1927 a guarantee fund of $500,000 for a ten year period to insure publication of such a journal, not more than $65,000 to be expended in any one year. By the fall of 1928 Professor F. Stuart Chapin of Minnesota University, chairman, had completed the organization of a staff, headquarters were established at 611 Fayerweather Hall, Columbia University, and the abstracting of books, pamphlets, monographs, bulletins and periodicals actively begun. It was planned to issue the first number early in 1929. The journal will appear monthly, and though printed in English only, will cover the literature of the world in the fields of cultural anthropology, history, human geography, political science, sociology, and statistics, broadly construed. On account of its scope and quality this journal was expected to become not only indispensable to all students and teachers of the social sciences, but an invaluable aid to all engaged in social research.

The Council has also been developing plans, possibly in conjunction with *Science Service*, for making known to a wider public the results of researches in the social science fields. In the spring of 1928 the Council announced a series of research fellowships in agricultural economics and rural sociology for the five years, 1928-1933. For this purpose $150,000 was set aside for the entire period. Dr. E. G. Nourse is chairman of the committee in charge. Eighteen fellows with stipends ranging up to $2500 were appointed.

The American Council of Learned Societies.—This body held its annual meeting at Washington, January 28, 1928, delegates being present from the fifteen constituent societies. A survey of *Research in the Humanistic and Social Sciences* by Dr. Frederic A. Ogg (published by The Century Company) was presented. While emphasizing the backwardness of research in these fields, Professor Ogg found numerous signs of recent progress. His work is a complete compendium of organizations and research activities in the social science fields. Professor Allen Johnson, editor-in-chief of the *Dictionary of American Biography*, reported that manuscripts for the first volume had been received and would be published shortly by Charles Scribner's Sons. The Council is also promoting research in American Indian languages through a committee composed of Franz Boas, Leonard Bloomfield and Edward Sapir. To finance this study the Carnegie Corporation has appropriated $10,000 per year for five years.

Professor Walter F. Willcox reported that the committee on Linguistic and National Stocks in the Population of the United States had reached tentative results widely different from figures generally accepted. The committee which is supported by a grant of $10,000 supplied by John D. Rockefeller, Jr., has two special investigators. Howard F. Barker, approaching the matter from the standpoint of linguistics, is endeavoring to measure the contributions of English, Scotch, Irish, Dutch, Germans and French. Marcus L. Hansen is studying the problem historically in an effort to approximate the population of various sections in 1790. The Council had for the last time in 1928 a sum of $5000 from the Laura Spelman Rockefeller Foundation for grants-in-aid of $50 to $300 to assist in the completion of researches in philology, archaeology, history, economics and ethnology. It hoped, however, to be able to secure a fund to enable it to continue this useful service. An advisory committee on research projects was appointed, as was also a committee to confer with the Social Science Research Council on matters of joint interest.

ENCYCLOPEDIA OF THE SOCIAL SCIENCES

A project to publish an Encyclopaedia of the Social Sciences originated in 1924 at a joint conference

of representatives of various learned societies. In 1926 Professor E. R. A. Seligman of Columbia University was elected editor, and proceeded at once to the task of raising a pledge fund of about $600,000. The following year, the fund having been raised, Dr. Alvin S. Johnson, director of the New School for Social Research, was chosen assistant editor and Dr. A. A. Goldenweiser, associate editor. Six assistants were retained and details relating to lists of contributors, scope and treatment of topics, cross references and other preliminaries worked out. The editor went to Europe to enlist the interest of European scholars. An Advisory Board of Editors was selected to represent the fields of law, philosophy, political science, psychology, sociology, statistics, anthropology, economics, education, history and hygiene. Seventeen members of this board are American and eleven, foreign. The plan did not contemplate the organization of an office staff able to write the varied and numerous articles, but rather the payment for contributions by experts in various fields. All assignments for contributions are made from the central office at Fayerweather Hall, Columbia University. Articles will usually not exceed 5000 words, though a few are expected to run to 20,000 words or more. All contributions will be paid at the same rate of two cents per word. Material for the first volume was expected to be in hand by December 1, 1928, and the first volume was expected to be published by the spring of 1929.

ADDITIONAL REFERENCES

Beard, Chas. A. (Ed.)—*Whither Mankind. A Panorama of Modern Civilization.* (N. Y.: Longmans, Green.)

Bogardus, Emory S.—*Immigration and Race Attitudes.* (Boston: Heath, 268 pp.)

Breckenridge, S. P. (Ed.) *Medical Social Case Records.* Submitted in the 1927 Case Competition of the American Association of Hospital Social Workers. (University of Chicago Press, 176 pp.)

Calkins, Earnest E.—*Business the Civilizer.* (Boston: Little Brown, 309 pp.)

Cavan, Ruth S.—*Suicide.* (University of Chicago Press, 357 pp.)

Dawson, Edgar.—*Teaching the Social Studies.* (N. Y.: Macmillan, 405 pp.)

Elliot, W. J.—*The Pragmatic Revolt in Politics. Syndicalism, Fascism and The Constitutional State.* (N. Y.: Macmillan, 540 pp.)

Gillin, J. L., Dittmer, C. G., and Colbert, R. J.—*Social Problems,* (N. Y.: Century and Co., 534 pp.)

Hertz, Friedrich.—*Race and Civilization.* (N. Y.: Macmillan, 328 pp.)

Hertzler, J. O.—*Social Progress.* (N. Y.: Century, 660 pp.)

Kavanagh, Marcus.—*The Criminal and His Allies.* (Indianapolis: Bobbs-Merrill, 432 pp.)

Kelso, Robert W.—*The Science of Public Warfare.* (N. Y.: Henry Holt, 428 pp.)

Piper, David R.—*The Community Church Movement.* (Chicago: Willett, Clark and Colby, 157 pp.)

Rice, Stuart A.—*Quantitative Methods in Politics.* (N. Y.: Knopf, 331 pp.)

Schlapp, Max G. and Smith, Edward H.—*The New Criminology.* (N. Y.: Boni and Liveright, 325 pp.)

Smith, Walter R.—*The Principles of Educational Sociology.* (N. Y.: Houghton Mifflin, 773 pp.)

Wood, Arthur E.—*Community Problems.* (N. Y.: Century Co., 589 pp.)

ANTHROPOLOGY AND ETHNOLOGY

By Clark Wissler

Curator of Anthropology, American Museum of Natural History

PHYSICAL ANTHROPOLOGY

Public Interest in Man's Origin.—The study of primitive man and his past is still in the public eye. Everyone wants to learn what is the last word on the antiquity and origin of

man. The year just closing has contributed its increment to the mass of data bearing upon this subject. For origin and antiquity we turn to the Old World, especially to Europe. No epoch-making discoveries have been made during the year, but among other important finds are those of Miss Dorothy Garrod, an English anthropologist, well known for her discovery of a Neanderthal skull at Gibraltar.

Neanderthal Man.—Miss Garrod returned to Gibraltar last year, resuming her excavations, and found the parts of a skull and jaws of a child belonging to the Neanderthal race. The first permanent molar was just erupting, from which it is inferred that the skull is that of a child about six years old, assuming that the teeth of Neanderthal children were erupted at the same period as among modern children. The importance of this find, however, lies in that each year new examples of Neanderthal man come to hand, so that anthropologists will soon be in a position to describe the local varieties of that extinct race. Doctor Hrdlicka, however, in his famous Huxley lecture, given in England, takes the view that Neanderthal man is not extinct, but passed directly into the present European type by gradation. In this opinion, however, he stands alone.

New Discoveries.—Of other discoveries, mention may be made of three skeletons found at Mechta, Algeria, by Paul Nesbit of the Logan Museum, Beloit, Wisconsin. These seem to belong to the Cro-Magnon type of man, successors to the Neanderthal in Europe. The bones found by Leaky in Kenya Colony, Africa, mentioned last year, have been augmented by further discoveries and seem to represent a transition race between the Old and the New Stone Ages. In China a molar tooth has been found similar to the finds of the last few years, all regarded as of the pleistocene age. From Heidelberg comes the report that bones of an ape-like man have come to light, a forerunner of Neanderthal man. Turning to North America, where a bitter controversy of many years' standing prejudices every discovery, new data have come to hand. The American Museum of Natural History in New York, following up the discoveries of the Denver Museum at Folsom, New Mexico, uncovered a group of skeletons of an extinct bison, apparently killed by man and associated with stone implements. The age of this find has not been determined, but geologists regard it as very old, if not pleistocene, at least at the beginning of the present era.

Studies and Conclusions.—Among studies upon old material, mention may be made of the work of W. P. Pycraft, in England, on the skeleton of Rhodesian man found in Africa several years ago. Pycraft shows that Rhodesian man was, in life, bent in posture and therefore belonged to one of the side branches of the human family. Studies upon living peoples have something to contribute also. Bean, University of Virginia, after an exhaustive survey of living races, shows that the shortest races live in tropical and frigid areas, whereas the tallest races are found in temperate climates. Burkitt of Sydney, Australia, finds among the natives of New Caledonia in the South Pacific, lower jaws closely resembling the famous Heidelberg jaw from Germany, which jaw, because of its striking peculiarities, has been attributed to an extinct species of man. The significance of the discovery of Burkitt lies in the suggestion that since somewhat similar jaws are found among living men, the head and face of the ancient Heidelberg man may have been far more human than has been assumed. Among physiological differences in races, we may note the report from Johns Hopkins Medical School, Chen and Poth, that the drugs used for enlarging the pupils of the eyes, in diagnosis for eye defects, operate differently in Chinese and Negroes from what they do in Whites. The reasons for this difference in reaction are not known. Again, studies of Indian children by Ferris show them to be shorter but heavier than White children of the corresponding age, while Klineberg finds the Indians slower in mental

tests, but making fewer mistakes. Musical tests given Indians by Miss Isbell show them inferior in pitch and memory, but superior in the sense of time.

ARCHAEOLOGICAL DISCOVERY

The South and Middle West.—Interest in prehistoric archæology still holds, especially in North America, where many investigations are undar way. At Etowah mound in Georgia, Moorehead continued excavations, bringing to light further evidences of a prehistoric development in the art of working bone and copper. It is now clear that a more complicated culture existed in the lower Mississippi Valley than hitherto assumed. In the upper Mississippi Valley, Shetrone of the Ohio State Survey has advanced our knowledge of mound cultures; Langford and the University of Chicago archæological party have developed a new problem in northern Illinois. Curious pits were found, apparently roofed over, to form houses, possibly the forerunners of the historic earth-covered house of the Pawnee and the Mandan. What is of more significance, however, is that a mound opened by these investigators proved to contain burials accompanied by European trade objects, showing that this mound was built since the discovery of America.

In New Mexico and Arizona, the romantic land of cliff dwellings, several investigators have been at work. Jenks, of Minneapolis, worked in the Mimbres Valley in New Mexico, studying ruins belonging to a prehistoric culture now famous for its unique pottery. Doctor Jenks dates this culture from 2000 B.C. to 600 A.D. Roberts fo the Smithsonian Institution explored a site in southwestern Colorado on the Piedra River. He reports this of special interest because the culture represented seems to be a link between the old Basket Maker cultures and that of the Pueblo Indian. Heretofore, no transition stage had been discovered. The site in question proved unusually interesting because fire had destroyed it, charring otherwise perishable objects, and thus preserving them.

Mississippi Valley.—The systematic archæological survey of states in the Mississippi Valley moves steadily forward. Doctor Guthe of the University of Michigan is the leader in this movement and has established a reference series for pottery in which it is hoped to gather samples from every county in the several states. A bill has been enacted by the Federal Government by which allotments of money may be made under certain conditions to states for archæological work; this is a long step forward and insures the development of these surveys along scientific lines.

Alaska has again received special attention from archæologists. The Stoll-McCracken expedition discovered some interesting Aleutian burials on Fortress Island in the Aleutian chain, examples of which are now on view in New York. Weyer, archæologist of the expedition, carried on excavations on the peninsula of Alaska, bringing to light some unusual carvings in whale bone. Collins of the Smithsonian Institution explored St. Lawrence Island, where a burial mound was discovered with bodies of Eskimos frozen and well preserved. These burials seem to have been made before the discovery of Alaska by the Russians, and the culture of the Eskimo at that time appears to have been highly developed. Collins regards Eskimo art to have reached its highest stage.

In Yucatan and Mexico archæological discoveries were made. The Carnegie Institution of Washington completed the excavations at the famous site of Chichen Itza in Yucatan. Early in the year Earl H. Morris, director of the work, found a stone jar containing the remains of a turquoise mosaic, which when restored proved to be a unique example of mosaic art. The mosaic is now deposited in the National Museum, Mexico City. Tulane University, New Orleans, had an expedition in northern Mexico to scrutinize the living Indians in out of the way places, seeking survivals of the ancient culture that built the ruins, making that country famous. It is assumed that many Indian tribes have changed but little since the days of temples and great cities.

Mexican archæologists have discovered a new temple in the State of Tlaxcala on the walls of which are well-preserved frescoes. Local residents made the initial discovery when digging for treasure in response to a rumor. The painted frescoes give excellent delineations of several Aztec gods. It was reported also that an earthquake in the State of Oaxaca opened a tomb of the Zapotecan period, yielding a collection of carved jade objects. Finally, the Mexican Government announces the complete excavation of the pyramidal structures just north of Mexico City, discovered several years ago. The sculptures are of unusual interest, suggesting a structure of considerable antiquity. The sides are steep, but provided with a stairway, the balustrades of which are elaborately carved. To seek the secrets of Aztec history in Rome may seem fantastic, but an important manuscript came to light in the Vatican library, one of the lost books of Sahagun. A publication on this document has been announced by Zelia Nuttal, a famous authority on prehistoric Mexico.

France.—In the prehistoric archæology of the Old World attention may be given, first, to the Glozel controversy in France. Near Glozel curious objects were dug up, among them clay tablets bearing characters assumed by some observers to represent the earliest stages in the development of the alphabet. Many investigators regard some of these objects as frauds and others as belonging to neolithic time.

Asia.—The Roy Chapman Andrews East Asiatic Expedition, while concerned chiefly with the geology and palæontology of the Gobi Desert, nevertheless gave attention to evidences of early man. The reports indicate numerous sites belonging to what Nelson calls the dune dweller stage of culture in Central Asia. The chronological place for this culture has not been determined, but probably falls just between the Old and the New Stone Ages. The expedition returned at the close of the year, but Pond, the archæologist of the party, has not made a full report upon the find.

INTERNATIONAL CONGRESS OF AMERICANISTS

The outstanding anthropological conference of the year was the meeting of the International Congress of Americanists in New York. This is an organization to which the countries of Europe and the New World send official delegates to discuss anthropological problems relating to the Americas. The meetings were held at the American Museum of Natural History in New York. More than a hundred scientific papers were presented, embodying the results of recent investigations and explorations. The United States Government made an appropriation toward the expenses of the meetings, in keeping with the official character of the proceedings.

PERSONNEL

Certain changes in the American anthropological personnel may be noted. Among losses by death are Pliny Earle Goddard and Charles W. Mead of New York; retirements, J. Walter Fewkes from the Bureau of American Ethnology in Washington and C. C. Willoughby from the Peabody Museum at Harvard; new appointees, Matthew W. Stirling, as chief of the Bureau of American Ethnology in Washington, and Ralph Linton to a professorship of anthropology in the University of Wisconsin.

MENTAL TESTS AND MEASUREMENTS

By Johnson O'Connor
General Electric Company

PSYCHOLOGICAL ADVANCE

Objective Trends.—As the future looks back upon 1928, it will not associate the year with any striking discovery in the realm of mental measurements, but think of it rather

as a period of sound growth, not only in technique, but in the world's attitude toward a new endeavor. During the last twelve months psychology has made a distinct stride toward the objectivity which characterizes other more advanced sciences, and humanity has shown a greater interest in, and willingness to accept, this attitude than ever before.

Election Poll Experiment.—The nation-wide poll, conducted by the *Literary Digest* just prior to the presidential election, was an attempt, on a gigantic scale, to predict on sound, objective data, handled by scientific methods, the combined mental action of forty million people in selecting a president. Although not accurate in every detail and far too expensive for anything of less importance than a presidential election, the experiment showed the possibility of forecasting such concerted decisions and, in addition, demonstrated a new attitude of the world toward the statistical study of human actions. Four years ago, a similar poll, before the election of 1924, stirred up considerable adverse criticism, and little scientific interest. This year, almost without exception, the newspaper comments were discussions of the probable accuracy, and suggestions of sources of error, showing that, in at least this one instance, the world is learning to take a more objective attitude toward measuring mankind.

Hoover Business Study.—Another research, not ordinarily thought of as belonging to the field of mental measurements, is the study which has been under way, under the direction of Mr. Hoover, in the attempt to understand more thoroughly the business ups and downs which continually affect large numbers of workers, and to formulate, at the same time, the trends in executive characteristics. Although neither the *Literary Digest* poll nor the studies inaugurated by Mr. Hoover would ordinarily be classed as mental measurements, all attempts to evaluate human tendencies objectively rightly belong in the field which ought to be psychology. One of the aims of present-day mental testing is to develop a technique for predicting more accurately than at present and at less cost just such human actions as these.

EDUCATIONAL TESTS

School Mark Checks.—The most thorough and farreaching mental test in existence is the school course, and yet little is known of its significance in predicting future courses of life. For almost the first time in the history of education, this year has witnessed an accurate scientific check of school marks against later business success. In *Harper's Magazine* for May, President Gifford of the American Telephone and Telegraph Company reports the statistical study of 3800 college graduates working with his concern. He finds that those men who obtained the best marks in college are, on the whole, the ones who now hold the highest salaried positions. A man who stands in the upper tenth of his class in college has seventeen chances in a hundred of receiving a salary among the highest ten per cent of those paid. A man, on the other hand, in the lowest third of his class in school, has but five chances in a hundred of receiving an equally high salary after the same amount of experience. For some time it has been known that the percentage of Phi Beta Kappa men who appear in *Who's Who* exceeds that of poorer scholars. Nevertheless, many have thought of those who receive extremely high marks as bookworms, unlikely to become leaders of men. The success of the good scholars, because unforeseen, demonstrates again, the increasing willingness of the world to take a more objective attitude toward life.

After-effects of School Policies.—For years parents and teachers have urged children to study, with the sincere feeling that it was for their best good, but with no grounds on which to offer a concrete reward as a result. Furthermore, pedagogues have argued among themselves on purely *a priori* data, insisting sometimes that pupils need a thorough grounding in the classics, or shifting to the other extreme, have declared with equal vehemence that they re-

quire unbounded freedom to develop individuality. But no scientist has followed boys, brought up under the two systems, to determine whither each leads in adult life. The research of the Telephone Company's staff, under the direction of Colonel Rees, should initiate other similar studies to determine the actual after-effects of varying school policies.

TESTS AGAINST LIFE

Measuring Prospects.—In the narrower world of mental tests and measurements, properly so-called, there are now available means of predicting a boy's prospects of success or failure in at least a hundred walks of life. No test today foretells infallibly the future of any given individual. But tests, even with their present crudities, are now successfully used for two practiced purposes: first, in telling the boy or girl his relative chances in a number of different occupations, any one of which he might enter; and secondly, in showing the employment manager the relative chances of his applicants in the particular type of work which he may have open at the time. Thus, some tests predict a boy's probable success in college courses. Others tell his chances in the clerical field: in auditing, general accounting, cost accounting, or in typing, stenography, or secretarial work. If he be more concrete minded, certain tests show his aptitudes for engineering, designing, drafting, or the higher types of mechanical work, such as die-making and tool-making. Still others throw light upon his type of personality.

Gathering Data from Life.—Although none of these measures were developed completely in 1928, the last twelve months have seen them brought to greater accuracy than ever before, largely due to the outstanding characteristic of the year, an insistence upon objectivity. Not long ago it sufficed to create a test which seemed, on the surface, to measure a wished-for quality, and then use it with confidence that it must be correct. Today not only should the test, before acceptance, be accurately validated by checking against life; but, in addition, the facts from life with which it is compared must in themselves present objective data, not mere matters of opinion. In an attempt to develop a technique for gathering scientific data from life, Walter V. Bingham and B. V. Moore have this year made an intensive study of the personal interview. The publication of their results in book form will be an important contribution to greater objectivity in the checking of mental measures.

School Coöperation.—The insistence upon checking the results of a test against actual success or failure in life has led to an interesting division of the work in test development. Schools are realizing that they must rely upon such studies as that of the Telephone Company not only to determine their own success but also that of their tests. As a result a close coöperation is growing between the schools, such as Worcester Academy (Massachusetts), a preparatory school for boys, has been measuring students with tests standardized on successful men in the professional and business worlds. This year has seen at least two other schools, the Public School System of Dayton, O., and the East Side Continuation School in New York, undertake the work on a sound scientific basis. For some time industry has felt keenly the enormous human waste represented by boys who come for work, after a long school training, with no idea of what they wish to do or for what they are fitted. The testing of boys and girls while still in school will save, at least for some, years of floundering about, and for others change a life of failure into one of happiness and success in the right occupation.

RESEARCH WORK

Test Development.—Another interesting result of this link between school and industry is a closer cooperation in the research work of test development. A test, to be satisfactory, must meet a multitude of conditions. Its results must be reproducible; that is, if administered to the same man on different days,

he must obtain the same relative score. Test results must not be affected by the way a man happens to feel on a particular day. A satisfactory test must measure a single characteristic at a time, and to be of practical value predict some actual part of future life. The schools cannot easily validate tests against life because they have no successful mechanics, successful clerks and successful engineers upon whom to experiment. They are, therefore, turning to the more scientific aspects, to the development of tests which are mathematically correct in reproducing themselves; and industries, on the other hand, are taking these and validating them against already successful men.

Applying Theory and Practice.—This splitting up of the development work in mental testing parallels the policy which has been followed for several years by English psychologists. There are, in England, two separate psychological organizations, one the Industrial Fatigue Research Board, operated at the expense of the government to study the theoretical problems continually arising in this new field of testing, and the other the National Institute of Industrial Psychology, an organization supported by industry which attempts to apply practically the findings of the Fatigue Board. Those problems which seem to be of general significance are given to the Fatigue Board for solution. Those which apply to specific cases are solved by the Institute at the expense of industry.

Conclusions.—With the extension of school testing, the feeling has grown each year that we must know, not only empirically that tests predict, but also a little of why they work as they do. So long as the school tells the pupil that present-day measures indicate merely relative chances of success at each occupation and are not absolute findings, the school is justified in using the findings. But the moment a boy is graded A or D, that mark is taken as an absolute finding and, because definite, is given more weight than it deserves. Psychological tests measure merely the surface manifestations of fundamental, underlying physical differences. Although no striking discoveries have been made, 1928 has seen a closer bond between psychology and physiology in an attempt to solve this problem.

MEASURING APTITUDES

Special Abilities.—Another trend, extending throughout the field of mental measuring, is a greater emphasis on special aptitudes. The industries of America must find positions for a representative cross-section of the community. To classify applicants as to their intelligence assists in placing only a small fraction. Such organizations, then, as the Dennison Manufacturing Company, the General Electric Company, the Scovill Manufacturing Company, and the Western Electric Company, are attempting to measure special abilities —finger dexterity, mechanical aptitude, and clerical aptitude—independent of whether or not a particular person possesses the general characteristics: concentration, attention, adaptability, or intelligence.

Although general intelligence tests correlate with scholastic marks and predict the chances of classroom success, the schools also are realizing that it is their duty not only to develop those possessed of scholastic ability, but also others equally outstanding in their own ways, but not gifted with this peculiar aptitude for book learning. This interest in specific rather than general abilities underlies much of the outstanding English work and what is probably the best work under way in Italy.

Test Conditions.—A question invariably asked is: How can one, seriously interested in a better understanding of his own abilities, obtain an opportunity to take, under standard conditions, the mental measures now in existence? Magazines and newspapers continually publish popular editions of tests for the amusement of readers. The past year has shown that such tests aid in whiling away an uneventful evening but tell nothing of one's aptitudes. To be of prognostic value present-day mental

measurements must be made in a standardized laboratory under as accurate conditions as would be demanded for chemical and physical experiments. During the past year several communities have created the opportunity for their boys and girls to take tests under ideal conditions, some through the schools, a few of which have already been mentioned; others through industries where these play large parts in community life, and still others through organizations of various kinds. The year 1928 has seen a distinct and sound advance not only in the accuracy of mental measurements, but in their availability to the general public.

BIBLIOGRAPHY

(Compiled by *The Journal of Personnel Research*)

DEARBORN, WALTER FENNO, M.D. *Intelligence Tests: Their Significance for School and Society.* (Boston: Houghton Mifflin Co., 1928, 360 pp., $2.50.)

GOODENOUGH, FLORENCE L. *The Kuhlman-Binet Tests for Children of Pre-School Age: A Critical Study and Evaluation.* (Minneapolis: University of Minneapolis Press, 1928, 158 pp., $2.00.)

HULL, CLARK L. *Aptitude Testing.* (Yonkers: World Book Company, 1928, 535 pp.)

PAULA, SISTER MARIE. *Shibboleths: Tests in Teaching-Efficiency.* (New York: Benziger Bros., 1928, 160 pp., $1.75.)

ROBACK, DR. ABRAHAM AARON. *Popular Psychology with Chapters on Character Analysis and Intelligence Tests.* (Cambridge, Mass.: Sci-Art Publishers, 1928, 267 pp., $2.00.)

RUCKMICK, CHRISTIAN ALBIN. *The Mental Life: A Survey of Experimental Psychology.* (New York: Longmans, Green and Company, 1928, 262 pp., $2.00.)

SMITH, HENRY LESTER, and WRIGHT, WENDELL W. *Tests and Measurements.* (New York: Silver Burdett and Company, 1928, 556 pp., $3.00.)

UHRBROCK, RICHARD STEVEN. *An Analysis of the Downey Will-Temperament Test.* (New York: Teachers College, Columbia University, 1928, 264 pp.)

To this list should be added: Albert E. Wiggam's new book *Exploring Your Mind* (Bobbs Merrill); *Mechanical Ability*, by Anderson, Toops, and Ulvin (Univ. of Minnesota Press), which will probably be dated 1928, although it has not actually appeared; and my book, entitled *Born That Way* (Williams and Wilkins Company, Baltimore, 1928, $5.00).

COGNATE SOCIETIES

AMERICAN PSYCHIATRIC ASSOCIATION.—Albany, New York.

AMERICAN PSYCHOPATHOLOGICAL ASSOCIATION. — 520 Commonwealth Ave., Boston, Mass.

AMERICAN PHILOSOPHICAL ASSOCIATION.—University of Oregon, Eugene, Oregon.

AMERICAN GENETIC ASSOCIATION.—Bureau of Plant Industry, Washington, D. C.

AMERICAN PHILOSOPHICAL ASSOCIATION, EASTERN DIVISION.—Columbia University, New York, N. Y.

AMERICAN SOCIETY FOR PSYCHICAL RESEARCH.—15 Lexington Ave., New York, N. Y.

AMERICAN SOCIAL SCIENCE ASSOCIATION.—280 Madison Ave., New York, N. Y.

AMERICAN SOCIOLOGICAL SOCIETY.—58th St. and Ellis Ave., Chicago, Ill.

ENCYCLOPÆDIA OF THE SOCIAL SCIENCES.—100 Morningside Drive, New York, N. Y.

NATIONAL COMMITTEE FOR MENTAL HYGIENE.—370 Seventh Ave., New York, N. Y.

PSYCHOLOGICAL CORPORATION. — 3939 Grand Central Terminal, New York, N. Y.

PART SEVEN
THE HUMANITIES

DIVISION XXV
LITERATURE AND LANGUAGE

HISTORY, BIOGRAPHY AND TRAVEL

By Arthur M. Schlesinger
Professor, Harvard University

MEDIEVAL HISTORY

The historiography of the year was marked by an unusual number of important contributions to our knowledge of European history and international relations. Particularly noteworthy in the field of medieval history were E. K. Rand, *Founders of the Middle Ages* (Cambridge: Harvard Univ.), concerned largely with intellectual currents; J. W. Thompson, *Economic and Social History of the Middle Ages* (N. Y.: Century); and the same author's *Feudal Germany* (Chicago: Univ. of Chicago), stressing institutional development. Of more general scope was A. F. Harlow, *Old Post Bags* (N. Y.: Appleton), a record of postal service throughout the world since earliest times.

THE MODERN PERIOD

Economic and Other Phases.—The modern period was approached from various angles. Economic phases were dealt with by H. L. Hoskins, *British Trade Routes to India* (N. Y.: Longmans, Green); and G. G. Jackson, *The Ship under Steam* (N. Y.: Scribner), an historical treatment of the development of steam power on the high seas. Institutional aspects were examined by E. R. Turner, *The Privy Council of England in the XVII and XVIII Centuries* (Balt.: Johns Hopkins), Vol. II, a continuation of a monumental work; and W. P. Hall, *Empire to Commonwealth* (N. Y.: Holt), an admirable summary of the last thirty years of British imperial history. The forces operating in modern Russia were treated by E. A. Walsh, *The Fall of the Russian Empire* (Boston: Little, Brown). Light was thrown on the history of the theater by Allardyce Nicoll, *The Development of the Theater* (N. Y.: Harcourt), tracing the history of the physical theater from its beginnings; and Leslie Hotson, *The Commonwealth and Restoration Stage* (Cambridge: Harvard Univ.)—containing new information about early playhouses and performances.

The Far East received special attention in the following works: P. J. Treat, *The Far East* (N. Y.: Harper), and H. M. Vinacke, *A History of the Far East in Modern Times* (N. Y.: Knopf), both concerned primarily with the modern history of China and Japan; Mrs. M. E. Harrison, *Asia Reborn* (N. Y.: Harper), a discussion of post-war trends by an observer; A. J. Brown, *Japan in the World of Today* (Chicago: Revell), sound and well informed; T. F. Millard, *China: Where It Is Today and Why* (N. Y.: Harcourt), based on first-hand knowl-

edge of an intelligent journalist; Paul Monroe, *China: a Nation in Evolution* (N. Y.: Macmillan), thoughtful and instructive; and Scott Nearing, *Whither China?* (N. Y.: Int. Pub.), an economic interpretation with a Marxian slant.

International Relations.—In the field of international relations the outstanding book of the year was S. B. Fay, *The Origins of the World War* (2 vols., N. Y.: Macmillan), the first purely scientific analysis of both the remote and immediate causes based on adequate source material. H. E. Barnes added to his previous discussions of the subject a volume entitled *In Quest of Truth and Justice* (N. Y.: National Hist. Society), containing interviews with wartime European statesmen and reprinting exchanges of views with critics of his position as to war guilt. A useful general summary of post-war international affairs was R. L. Buell, *Europe: a History of Ten Years* (N. Y.: Macmillan). More restricted in range were J. S. Bassett, *The League of Nations* (N. Y.: Longmans, Green), an objective consideration by a trained historian, and R. L. Buell, *The Native Problem in Africa* (2 vols., N. Y.: Macmillan), a scholarly and exhaustive exposition.

AMERICAN FOREIGN RELATIONS

Diplomatic Policy.—In the field of American diplomacy the year saw the addition of Volumes IV-VIII to S. F. Bemis's (ed.) *The American Secretaries of State and Their Diplomacy* (N. Y.: Knopf), carrying this important coöperative enterprise through the secretaryship of Richard Olney. A comparable work, much smaller in compass, was Beckles Willson's *America's Ambassadors to France* (N. Y.: Stokes), discussing their rôle in Franco-American relations from 1777 to 1927. Of first importance was the inauguration of a series of annual reviews of *American Foreign Relations* (New Haven: Yale Univ.), edited by C. P. Howland under the direction of the Council on Foreign Relations. Two books of a general scope were J. M. Mathews, *American Foreign Relations* (N. Y.: Century), and Arthur Bullard, *American Diplomacy in the Modern World* (Phila.: Univ. of Pa.). Of more specialized interest were A. L. P. Dennis, *Adventures in American Diplomacy* (N. Y.: Dutton), treating international relations 1896-1906; and F. L. Schuman, *American Policy toward Russia since 1917* (N. Y.: Int. Pub.).

Foreign Contacts.—A number of works dealt more particularly with the contacts of the United States with other countries of the New World. C. E. Hughes, *Our Relations to the Nations of the Western Hemisphere* (Princeton: Princeton Univ.), defended the policies of the United States, while C. H. Haring, *South America Looks at the United States* (N. Y.: Macmillan), showed how these policies were regarded by Latin Americans. Significant special studies were I. J. Cox, *Nicaragua and the United States, 1909-1927* (Boston: World Peace Foundation), detailed and impartial; M. M. Knight, *Americans in Santo Domingo* (N. Y.: Vanguard), a searching examination; and H. P. Davis, *Black Democracy* (N. Y.: Dial); a historical survey of Haiti. Latin America was studied for its own sake in J. F. Rippy, *Latin America in World Politics* (N. Y.: Knopf), sound and well informed; H. A. Gibbons, *The New Map of South America* (N. Y.: Century), a discussion of domestic and international relations; E. H. Gruening, *Mexico and Its Heritage* (N. Y.: Century), an able political and social interpretation in the light of Mexico's past; and Mrs. Margaret C. Marsh, *Bankers in Bolivia* (N. Y.: Vanguard), an admirable guide to the economic problems of Bolivia. Carl Wittke, *History of Canada* (N. Y.: Knopf), proved to be the best single-volume survey yet published of the country north of us.

AMERICAN HISTORY

Collaborative Works.—The chief energies of American historians were given, as usual, to the exploration of the domestic history of their own country. Of the important collaborative histories, one new volume was added to the *History of American Life* (N. Y.: Macmillan), edited by

A. M. Schlesinger and D. R. Fox; *The Coming of the White Men* (I) by H. I. Priestley; and three new ones to R. H. Gabriel's (ed.), *The Pageant of America* (New Haven: Yale Univ.); William Wood, *In Defense of Liberty* (VII), J. S. Bassett, *Makers of a New Nation* (IX), and L. A. Weigle, *American Idealism* (X), the last dealing with religious development. A second volume was added to the notable composite work, edited by A. B. Hart, entitled *The Commonwealth History of Massachusetts* (N. Y.: State History Co.).

Colonial Period.—The period of exploration and American colonial development received study in Nellis M. Crouse's *In Quest of the Western Ocean* (N. Y.: Morrow), a detailed account of early trading enterprises; Hendrik Van Loon, *Life and Times of Pieter Stuyvesant* (N. Y.: Holt), a sprightly human story; R. G. Adams, *Pilgrims, Indians and Patriots* (Boston: Little, Brown), a fabric of contemporary pictures of colonial adventure bound together by interesting narrative; H. W. Lawrence, *The Not Quite Puritans* (Boston: Little, Brown), showing that not all Puritans were puritanical; Hayes Baker-Crothers, *Virginia and the French and Indian War* (Chicago: Univ. of Chicago), concerned primarily with legislative and administrative details; A. H. Hirsch, *The Huguenots of Colonial South Carolina* (Durham: Duke Univ.), throwing new light on the early history of an important immigrant element; C. H. Van Tyne, *England and America* (N. Y.: Macmillan), ripe reflections on the American Revolution by a leading authority; Alice M. Baldwin, *The New England Clergy and the American Revolution* (Durham: Duke Univ.), an important addition to the literature of the subject; Michael Kraus, *Intercolonial Aspects of American Culture on the Eve of the Revolution* (N. Y.: Columbia Univ.), emphasizing the cultural unity which underlay common political action; Allen French, *The Taking of Ticonderoga in 1775* (Cambridge: Harvard Univ.), based on the papers of General Gage; and Hoffman Nickerson, *The Turning Point of the Revolution* (Boston: Houghton, Mifflin), a thorough and judicial study of Burgoyne's campaign.

Constitutional Development. — Charles Warren added to his important writings on constitutional development *The Making of the Constitution* (Boston: Little, Brown), describing through the medium of source materials each day of the Federal Convention. Frederic Bancroft, *Calhoun and the South Carolina Nullification* (Balt.: Johns Hopkins), offered little not already known. F. A. Shannon's *The Organization and Administration of the Union Army* (2 vols., Cleveland: Clark), is a notable study buttressed by wide research, vividly written and portraying conditions from the standpoint of the common man. Another Civil War study was W. M. Robinson, Jr., *The Confederate Privateers* (New Haven: Yale Univ.), a collection of exciting tales. Two other works falling within the more recent period were C. C. Rister, *The Southwestern Frontier, 1865-1881* (Cleveland: Clark), dealing with the progress of settlement, and T. M. Johnson, *Without Censor. New Light on Our Greatest World War Battles* (Indianapolis: Bobbs-Merrill), written by an American war correspondent.

Parties and Campaigns.—As 1928 was a presidential election year, due attention was given to party history and campaign biographies. In the former categroy were C. A. Beard, *The American Party Battle* (N. Y.: Macmillan), a brief and succinct consideration of the development and meaning of American parties; W. S. Myers, *The Republican Party* (N. Y.: Century), the best one-volume treatment of the subject; F. R. Kent, *The Democratic Party* (N. Y.: Century), the best one-volume treatment, composed with vividness and insight; Henry Minor, *The Story of the Democratic Party* (N. Y.: Macmillan), a pedestrian performance, and Allan Franklin, *The Trail of the Tiger* (N. Y.: Burt), a history of Tammany Hall written with hostile bias. A compilation of a new kind was Allan Nevins, ed., *American Press Opinion*

(Boston: Heath), an anthology of editorial comment on important events from 1785 to the present.

Economics. — American economic history received its innings in the following works: H. U. Faulkner, *Economic History of the United States* (N. Y.: Macmillan), a simplified version of his larger treatment of the same subject; E. P. Hohman, *The American Whalemen* (N. Y.: Longmans, Green), a study of the whaling industry; J. W. Starr, Jr., *One Hundred Years of American Railroading* (N. Y.: Dodd, Mead), popular and informative; R. C. Epstein, *The Automobile Industry* (N. Y.: Shaw), tracing its economic and commercial growth; Ernest Greenwood, *Aladdin, U. S. A.* (N. Y.: Harper), an account of the revolution effected in American life through applied electricity in other forms than the telegraph and telephone; and F. M. Surface, *The Grain Trade during the World War* (N. Y.: Macmillan), a critical exposition of the work of government regulation of cereal foods.

Architecture.—Various phases of American *Kulturgeschichte* came in for attention. Historical treatments of the fine arts were S. F. Kimball's *American Architecture* (Indianapolis: Bobbs-Merrill), showing its development from the log cabin to the skyscraper; G. H. Edgell, *American Architecture of Today* (N. Y.: Scribner), emphasizing present-day tendencies; Alice V. L. Carrick, *Shades of Our Ancestors* (Boston: Little, Brown), treating the evolution of the art of silhouette; and F. L. Olmstead, Jr., and Theodora Kimball, (eds.), *Frederick Law Olmstead, Landscape Architect, 1822-1903* (N. Y.: Putnam), Vol. II—tracing the history of Central Park, New York.

Social.—In the field of American social history perhaps the outstanding work was Gilbert Seldes, *The Stammering Century* (N. Y.: Day)—a thoughtful and scholarly consideration of the main manifestations of eccentric religious expression in the nineteenth century. C. F. Thwing, *The American and the German University* (N. Y.: Macmillan), dealt with the influence of the German university on the American in the last century.

Historical Society Treatises.—Besides the historical treatises already referred to, there was the usual activity on the part of national, regional, state and local historical societies whose joint output, in the form of articles, monographic publications and reprints of source documents, far exceeded in volume the other historical productions of the year. Worthy of special note was the establishment of two new historical journals: *The New England Quarterly: An Historical Review of New England Life and Letters*, the first number of which appeared in January under the editorship of L. S. Mayo, Cambridge, Mass., and the *Journal of Economic and Business History*, a quarterly begun in November under the sponsorship of the Harvard Graduate School of Business Administration and the Business History Society, with E. F. Gay as editor. The only attempt to survey history in its relations to the other social sciences was Wilson Gee (ed.), *Fundamental Objectives and Methods of Research in the Social Sciences* (N. Y.: Macmillan), a symposium by specialists, including John Dewey, Roscoe Pound and Clark Wissler.

BIOGRAPHY

Dictionary of American Biography.—The most memorable event of the year was the appearance of the first volume of *Dictionary of American Biography* (N. Y.: Scribner), Allen Johnson, ed., to be complete in 20 volumes, a monumental biographical reference work of broad scope planned by the American Council of Learned Societies and comparable to the British *Dictionary of National Biography.*

Collective Works.—There was an unusual number of single-volume collective biographies: J. T. Ferais, *The Romance of Forgotten Men* (N. Y.: Harper), a gallery of piquant portraits, including Baron Stiegel, the glassmaker, and Christopher Ludwig who baked the Continental Army's bread; D. C. Seitz, *The Also Rans* (N. Y.: Crowell), sketching quickly the

careers of defeated presidential candidates; M. A. DeWolfe Howe, *Classic Shades* (Boston: Little, Brown), pen portraits of five great leaders in the history of American higher education; E. H. Griggs, *American Statesmen* (Croton-on-Hudson: Orchard Hill), short studies of six American statesmen; M. Holland and H. F. Pringle, *Industrial Explorers* (N. Y.: Harper), concerned with leaders of American business and industry; H. F. Pringle, *Big Frogs* (N. Y.: Macy-Masius), clever etchings of contemporaries who have reached the headlines of the newspapers; and W. A. White, *Masks in a Pageant* (N. Y.: Macmillan), a breezy and sometimes flippant narrative of political events since Harrison in terms of personalities. Nor were the ladies forgotten in Richardson Wright, *Forgotten Ladies* (Phila.: Lippincott), lively characterizations of nine of the sex of more or less importance in American History.

Early American.—The drift away from "debunking," observed in the biography of last year, was even more noticeable in 1928, though a considerable amount of attention continued to be given to unconventional and relatively obscure persons. Early American biography was represented by William McFee, *The Life of Sir Martin Frobisher* (N. Y.: Harper), the first complete biography of the great Elizabethan seaman; J. G. Fletcher, *John Smith—and Also Pocahontas* (N. Y.: Brentano), containing nothing new; Ralph and Louise Boas, *Cotton Mather* (N. Y.: Harper), in part a psychological study; H. D. Sedgwick, *La Fayette* (Indianapolis: Bobbs-Merrill), sound and well proportioned; Meade Minnigerode, *Jefferson, Friend of France, 1793* (N. Y.: Putnam), based on the private papers of Citizen Gênet; Willis Steel, *Benjamin Franklin of Paris* (N. Y.: Minton, Balch), depicting his career in France 1776-1785; Samuel McCoy, *This Man Adams* (N. Y.: Brentano), a careful biography of John Adams in sprightly manner; J. B. Wilbur, *Ira Allen* (Boston: Houghton, Mifflin), a well-drawn picture of the founder of Vermont; and Elizabeth L. Dean, *Dolly Madison* (Boston: Lothrop), written with balance and judgment.

The Civil War continued to be of major interest to biographers, yielding valuable studies in W. E. Woodward's *Meet General Grant* (N. Y.: Liveright): Allen Tate, *Stonewall Jackson* (N. Y.: Minton, Balch); and R. W. Winston, *Andrew Johnson, Plebeian and Patriot* (N. Y.: Holt). Probably the most notable biography of the year was A. J. Beveridge's posthumous work, *Abraham Lincoln, 1809-1858* (2 vols., Boston: Houghton, Mifflin), a masterly production based on unflagging research. Other contributions to Lincolniana were Lucy F. Madison, *Lincoln* (Phila.: Penn), a brief sketch; F. T. Hill, *Lincoln, Emancipator of the Nation* (N. Y.: Appleton), another short life; W. E. Barton, *Abraham Lincoln and Walt Whitman* (Indianapolis: Bobbs-Merrill); W. E. Dodd, *Lincoln or Lee* (N. Y.: Century), a comparison of the two opposing leaders; Katherine Helm, *Mary, Wife of Lincoln* (N. Y.: Harper; and Honoré W. Morrow, *Mary Todd Lincoln* (N. Y.: Morrow), an attempt at the difficult task of rehabilitation.

Frontier heroes were studied in J. A. James, *The Life of George Rogers Clark* (Chicago: Univ. of Chicago), well balanced and thorough; George Creel, *Sam Houston* (N. Y.: Cosmopolitan), journalistic; Stanley Vestal, *Kit Carson* (Boston: Houghton, Mifflin), vivacious and informing; and Allan Nevins, *Fremont: the West's Greatest Adventurer* (2 vols., N. Y.: Harper), a full-length portrait derived from a study of unused materials.

Political Leaders.—Interest in the presidential campaign was reflected in William Hard's *Who's Hoover?* (N. Y.: Dodd, Mead); Will Irwin, *Herbert Hoover* (N. Y.: Century); Earl Reeves, *This Man Hoover* (N. Y.: Burt); Norman Hapgood and Henry Moskowitz, *Up from the City Streets* (N. Y.: Harcourt)—a friendly appraisal of Governor Smith; and T. H. Dickinson, *The Portrait of a Man as Governor* (N. Y.: Macmillan), a less popular treatment of Al-

fred E. Smith. Other recent political personages were dealt with in J. C. Long, *Bryan, the Great Commoner* (N. Y.: Appleton)—the best life of Bryan; and C. G. Washburn, *The Life of John W. Weeks* (Boston: Houghton, Mifflin).

Industrial Leaders.—Leading figures in the building of industrial America were treated in C. L. Lewis' *Matthew Fontaine Maury* (Annapolis: U. S. Naval Inst.), scholarly and readable; A. D. Turnbull, *John Stevens* (N. Y.: Century), the story of a notable family of engineers, Col. Stevens and his three sons, based on family papers; R. I. Warshow, *Jay Gould* (N. Y.: Greenburg), interesting but superficial; R. H. Fuller, *Jubilee Jim* (N. Y.: Macmillan), a lively portrait of James Fisk, Jr.; J. B. M. Harvey, *Henry Clay Frick* (N. Y.: Scribner) J. W. Jenkins, *James B. Duke* (Garden City: Doubleday, Doran), the rise of a North Carolina tobacco king; L. F. Swift and Arthur Van Vlissinger, *The Yankee of the Yards* (N. Y.: Shaw), the story of the life of the founder of the Swift Packing Company; and Catherine Mackenzie, *Alexander Graham Bell* (Boston: Houghton, Mifflin), based largely on Bell's own reminiscences.

Flyers and Others.—The first man to fly over the North Pole was the subject of biographies by two personal friends: Fitzhugh Green, *Dick Byrd, Air Explorer* (N. Y.: Putnam), and C. J. V. Murphy, *Struggle: The Life and Exploits of Commander Richard E. Byrd* (N. Y.: Stokes). Three volumes were devoted to champions of social reform: Rheta C. Dorr, *Susan B. Anthony* (N. Y.: Stokes), an excellent biography of an early feminist; Emanie Sachs, *The Terrible Siren* (N. Y.: Harper), depicting the bizarre career of Victoria Woodhull, the so-called "Firebrand of the Eighties"; and Justin Steuart, *Wayne Wheeler* (Chicago: Revell), a friendly appraisal by Wheeler's confidential secretary.

Intellectual Leaders.—American intellectual development was illustrated by biographies of certain of its leaders, notably P. K. Guilday, *The Life and Times of John England* (N. Y.: America Press), dealing with the life of the first bishop of Charleston and the contemporary history of the Catholic Church in America; R. M. Gay, *Emerson* (Garden City: Doubleday, Doran), a narrative and interpretation for young people; Caroline Ticknor, *May Alcott* (Boston: Little, Brown), the vividly told story of the Amy of *Little Women;* Harold Kellock, *Parson Weems of the Cherry-Tree* (N. Y.: Century), an amusing picture of a great historical myth-maker; C. M. Fuess, *Rufus Choate* (N. Y.: Minton, Balch), an inadequate treatment; H. H. Saunderson, *Charles W. Eliot, Puritan Liberal* (N. Y.: Harper); T. W. Goodspeed, *William Rainey Harper* (Chicago: Univ. of Chicago), an intimate, human life of the first president of the University of Chicago; D. C. Seitz, *The James Gordon Bennetts, Father and Son* (Indianapolis: Bobbs-Merrill), a biographical record of the proprietors of the *New York Herald;* and J. K. Winkler, *W. R. Hearst* (N. Y.: Simon & Schuster), a friendly criticism of an "American phenomenon."

Drama and Music.—The art of the theater was approached biographically in Constance Rourke, *Troupers of the Gold Coast* (N. Y.: Harcourt), relating the career of Lotta Crabtree, a popular soubrette of the seventies and eighties; Mary Lawton, *Schumann-Heink* (N. Y.: Macmillan); Mrs. Dorothy Caruso and Mrs. Torrance Goddard, *Wings of Song* (N. Y.: Minton, Balch), an intimate portrayal of Caruso by his wife and sister-in-law; and Harold Kellock, *Houdini* (N. Y.: Harcourt), an account of the magician based on the recollections and papers of his wife.

DIARIES AND MEMOIRS

The volumes of diaries and memoirs were widely representative of the diverse interests of American life. Among the more noteworthy were Allan Nevins's (ed.), *The Diary of John Quincy Adams* (N. Y.: Longmans, Green), a compilation abbreviated from the rare twelve-volume edition; William French, *Some Rec-*

ollections of a Western Ranchman (N. Y.: Stokes), a graphic account of ranching life in New Mexico in the eighties and nineties; Mildred Howells, (ed.), *William Dean Howells: Life in Letters* (Garden City: Doubleday, Doran), affording an intimate view which does not materially affest the established picture of Howell's personality; Irving Bacheller, *Coming Up the Road* (Indianapolis: Bobbs-Merrill), a record of memories of a North Country boyhood; J. P. Sousa, *Marching Along* (Boston: Hale, Cushman & Flint), genial recollections of the "March King"; Eddie Foy and A. F. Harlow, *Clowning through Life* (N. Y.: Dutton), the diverting memories of a popular comedian; and I. T. Bush, *Working with the World* (Garden City: Doubleday, Doran), a combination of autobiography and sage observations by the founder of the Bush Terminal Company.

Light was shed on the life and personalities of recent American statesmen by Theodore Roosevelt, *Diaries of Boyhood and Youth* (N. Y.: Scribner); B. J. Hendrick, ed., *The Training of an American* (Boston: Houghton, Mifflin), the early career and letters of W. H. Page; and Charles Seymour's (ed.), *The Intimate Papers of Colonel House* (Boston: Houghton, Mifflin), Vols. III and IV, completing the revelations of a war-time statesman.

FOREIGN BIOGRAPHY

In the field of foreign biography should be noted Edward McCurdy, *The Mind of Leonardo da Vinci* (N. Y.: Dodd, Mead), a carefully documented study; Rachel A. Taylor, *Leonardo the Florentine* (N. Y.: Harper), colorful and somewhat ecstatic; Milton Waldman, *Sir Walter Raleigh* (N. Y.: Harper), a discriminating portrayal; G. O. Griffith, *John Bunyan* (Garden City: Doubleday, Doran), well balanced and scholarly; W. H. Nelson, *Tinker and Thinker: John Bunyan* (Chicago: Willett, Clark & Colby), a brief account; Iris Barry, *Portrait of Lady Mary Montagu* (Indianapolis: Bobbs-Merrill), a disconcerting mixture of novel writing and biography; C. S. Forester, *Louis XIV* (N. Y.: Dodd, Mead), readable but not always reliable; Norwood Young, *Carlyle* (N. Y.: Morrow), a compact treatment; and Norman Flower, *Franz Schubert* (N. Y.: Stokes), based largely on newly discovered papers.

TRAVEL

Seafaring and Exploration.—The literature of contemporary travel covered a wide range, and American readers safely ensconsed by their firesides were given ample opportunity to enjoy the vicarious experience of strange lands and countless hairbreadth escapes. Among the wealth of such books the following were representative: Andrew Farrell, *John Cameron's Odyssey* (N. Y.: Macmillan), a thrilling transcript of thirty years of adventure on three seas; R. A. Bartlett, *The Log of Bob Bartlett* (N. Y.: Putnam), an unvarnished tale of forty years of seafaring and exploration; L. R. Freeman, *The Nearing North* (N. Y.: Dodd, Mead), describing adventures in the Hudson Bay country.

The Tropics.—William Beebe's *Beneath Tropic Seas* (N. Y.: Putnam), is the report of five months' experience in the tropical waters of Haiti; E. A. Aspinwall, *Wayfarer in the West Indies* (Boston: Houghton, Mifflin), urbane notes by a well-informed guide; T. W. F. Cann, *Maya Cities* (N. Y.: Scribner), a record of exploration in middle America; Rosita Forbes, *Adventure* (Boston: Houghton, Mifflin), recounting travels in New Guinea and Africa.

Asia.—R. M. Elliott's *The Sunny Side of Asia* (N. Y.: Century), records a journey across Asia to the China Sea; Elizabeth Keith, *Eastern Windows* (Boston: Houghton, Mifflin), an artist's descriptions of scenes in the Far East with pictures in color; Mildred Cable and Francesca French, *Through Jade Gate and Central Asia* (Boston: Houghton, Mifflin), an account of the first trip by Western women across the Gobi Desert; J. W. Wood, *Incredible Siberia* (N. Y.: Dial), observations of a shrewd journalist.

Russia.—Theodore Dreiser's *Dreiser Looks at Russia* (N. Y.: Liveright), is a sympathetic interpretation; Dorothy Thompson, *New Russia* (N. Y.: Holt), discusses all phases of life; I. L. Lee, *Present-Day Russia* (N. Y.: Macmillan), impressions of the impressionistic type based on a ten-day visit.

Miscellaneous.—H. A. Franck, *The Fringe of the Moslem World* (N. Y.: Century), describes conditions in the countries of the eastern Mediterranean. For readers who like their adventures *olla-podrida* fashion there was published, N. J. Davidson, *The Romance of Modern Travel* (Phila.: Lippincott), a medley of exploration and adventure in all parts of the world during the last fifty years based upon the travelers' own accounts.

AMERICAN FICTION

By Albert R. Elsasser

Assistant Professor, Princeton University

CONTEMPORARY TRAITS

New Forms and Modifications.—The contemporary novel is increasingly difficult to confine within the limits of a single definition. The younger writers particularly continue to experiment with new forms and modifications of old ones. The reader who attempts to keep abreast of things will find himself confronted at one time or another with the forthright social tract, the leisurely chronicle, the tale of delicate and poetic phantasy, the thinly disguised biography, the Freudian investigation, the collection of brief and remotely connected episodes, and the monologue. However, with one brilliant exception, and two others not so brilliant, the best novels of the year adhere substantially to the older tradition in form and style.

Reaction from "Naturalistic" Novel.—Of significance is the decline of the "naturalistic" novel fostered in recent years by Sinclair Lewis, Dreiser, Anderson, and others. In general it can be said that there is a reaction from the inartistic quality of the "novel of destruction" as well as from its theme. As to the latter, the vein seems to have given out for the present. At any rate, there is among novelists a growing interest in the more universal phases of human life, and less inclination to search out and emphasize the ignoble traits in human nature.

NEW NOVELS

Quantity *vs.* Quality.—Two novels stand well above the rest in thought and artistry. They are Thornton Wilder's *The Bridge of San Luis Rey* (published late in 1927), and Mrs. Wharton's *The Children*. Otherwise the year's output is distinctly mediocre, excelling in quantity rather than in quality. It is a day in which "everybody reads books, and nearly everybody writes them." One hopeful sign, however, is the emergence of a small group of new and young writers of promise, if not yet of accomplishment. They are well trained and well informed, have a realization that the novel is an art form, and have broken completely with the school of novelists that has set the fashion for the last decade. Their development will be interesting to follow, and perhaps important.

Thornton Wilder.—Thornton Wilder: *The Bridge of San Luis Rey* (Boni) is by common consent the most notable novel of the year. Set in Peru of two centuries ago, it tells the life-stories of five people who were precipitated from an osier bridge. The story is developed with fine subtlety, and is written in a beautiful and limpid style. Mr. Wilder's final comment on his study of the human heart is that "there is a land of the living and a land of the dead, and the bridge is love, the only surviving meaning."

Edith Wharton: *The Children* (Appleton), written with the author's usual competence, portrays the fate of children cast adrift by divorced and re-married parents. There is a parallel story of unrealized love and the loneliness that ensues. The satire is deft and effective.

Ludwig Lewisohn: *The Island Within* (Harper) is the story of the unsuccessful attempt of a Jewish physician to disown his tradition and find a place in non-Jewish society. It is an excellent analysis of the Hebrew mind, and is told with convincing realism and emotional power.

Ruth Suckow: *The Bonney Family* (Knopf) depicts twenty years in the life of a minister's family in Iowa. The relentless warfare of diverse temperaments is patiently endured until the final dissolution of the family. Miss Suckow's stories have often been likened to Dutch paintings, in their attention to minute detail and in their unhurried execution.

Louis Bromfield: *The Strange Case of Miss Annie Spragg* (Stokes) presents an extraordinary medley of scenes and characters, grouped around the death of an eccentric old maid in Italy. It is a tale, or a series of tales, about religious fanaticism, thrown against a background of superstition and abnormality.

Wilbur Daniel Steele: *Meat* (Harper) is a short novel, the story of a mother's almost insane desire to protect her abnormal son from temptation. The result of sacrificing the fit to the unfit is a warped and almost ruined family. In technique this novel compares unfavorably with the author's masterful short stories.

Elinor Wylie.—The late Elinor Wylie's *Mr. Hodge and Mr. Hazard* (Knopf) is a delicately written story of the sufferings of a sensitive poet in a harsh world. It is a compound of deft comedy and mild satire. The poet is avowedly a composite of the early nineteenth-century romantics.

Gertrude Atherton: *The Jealous Gods* (Liveright) is a dramatic tale of Alcibiades and his times. Mrs. Atherton shows once again her mastery in depicting a former age in all its movement and color.

Anne Parrish: *All Kneeling* (Harper) conducts a relentless dissection of the character of a beautiful, selfish, and hypocritical young woman who, though not brilliant, exploits herself most successfully, and has the members of her small world kneeling at her feet.

Booth Tarkington: *Claire Ambler* (Doubleday) is another full-length portrait of a predatory young woman. Mr. Tarkington's latest heroine is shown, in three long episodes, playing rather cruelly with her lovers, and finally, at twenty-five, accepting a prosaic marriage. The book is written with the author's usual careful workmanship.

THE STUDY OF CHARACTER

Susan Glaspell: *Brook Evans* (Stokes), laid in the Middle West and in Europe, is a study of a neurotic woman in her relations with her mother and her son. Morley Callaghan: *Strange Fugitive* (Scribner's) is a widely hailed novel by a young Canadian writer. It is a story of a Toronto lumber-yard foreman who turns bootlegger. A. Hamilton Gibbs: *Harness* (Little, Brown) is a somewhat sentimental tale of the first years of married life: the setting is England. Thomas Beer: *The Road to Heaven* (Knopf) is the third novel by the author of *The Mauve Decade.* It is a study of three types of people, written in highly polished prose. Also stylistic, but with a difference, is Frances Newman: *Dead Lovers Are Faithful Lovers* (Boni, Liveright). Two books by John Erskine, *Adam and Eve* (published late in 1927) and *Penelope's Man* (both Bobbs Merrill) deal respectively with the story of Eden and the figure of Ulysses. Mr. Erskine develops the characterization with his usual sophistication. Similar in treatment is Murray Sheehan's *Eden* (Dutton), which develops into a satire on parents and religion. Josephine Bentham: *Bright Avenues* (Henkle), laid in San Francisco, is a story of a woman's sacrifices for love. John V. A. Weaver: *Her Knight Comes Riding* (Knopf) reveals "in American" the heart of a romantic Brooklyn stenographer.

Isa Glenn: *Southern Charm* (Knopf) is a penetrating study of a Southern woman who has moved North. The author employs the "stream of consciousness" method. J. C. Mellett: *High Ground* (Bobbs Merrill) presents a portrait of an independent newspaper editor as seen through the eyes of his five children.

THE NOVEL OF MANNERS

Changing society is reflected in two novels of the year. John Wiley: *Queer Street* (Scribner's) shows the decay of an old New York family of the "brownstone front" era. Larry Barretto: *Old Enchantment* (Day) shows the old order obstinately refusing to yield up its ideals. Nathalie Sedgwick Colby: *A Man Can Build a House* (Harcourt) presents vividly the types of people in a great metropolis, and the pressure under which they live. The younger generation is shown in a more or less unfavorable light in a host of books, of which Tarkington's *Claire Ambler* is the only one of any note. Others which were the cause of some discussion are Vina Delmar: *Bad Girl* (Harcourt), a story of the joys and woes of a young married pair in "white Harlem"; Warner Fabian: *Unforbidden Fruit* (Boni, Liveright), intended to be a sensational picture of life in a girls' college; and E. E. Taylor: *Not Magnolia* (Dutton) recounts the love story of a Southern college girl.

THE GREAT AMERICAN BANDWAGON

The satirical novel setting forth one or another corner of the American scene is represented by a list of mediocre imitative stories. Sinclair Lewis: *The Man Who Knew Coolidge* (Harcourt) shows the founder of the "Babbitt School" reduced to imitating himself. N. A. Crawford: *A Man of Learning* (Little, Brown) is an ironical portrait of a college president of the booster type. The satire is so unrelieved as to defeat the author's purpose. Brand Whitlock: *Big Matt* (Appleton) is the story of a political boss. Finally, Upton Sinclair: *Boston* (Boni) is a lengthy pseudo-epic inspired by the Sacco-Vanzetti trial. All ranks of society from the highest to the lowest figure in this latest chapter of the author's denunciation of modern institutions.

THE NEGRO

Julia Peterkin.—There has been, since Carl Van Vechten's *Nigger Heaven* of several years ago, an unbroken succession of novels about negro life, northern and southern. The list for the year contains one notable book, Julia Peterkin's *Scarlet Sister Mary* (Bobbs Merrill). It is a study of Gullah negro life, less intense than the author's *Black April*, but written with a firmer touch.

Howard Odum: *Rainbow Round My Shoulder* (Bobbs Merrill), a negro Odyssey, recounts in loose narrative the wanderings of a negro through many states. The hero tells the story in his own dialect. The book is interspersed with songs, and there is occasional comment by the author, who is an authority on negro life.

Emmet Kennedy: *Gritney People* (Dodd, Mead), like the former book, is not strictly a novel, but a collection of thirty-three tales told by the negroes of a Louisiana village at their meetings in the cook shop of an old negro woman. The book is a record of the daily life of these people.

Harlem Life.—Rudolph Fisher: *Walls of Jericho* (Knopf) is a romantic love story cast against a full and realistic picture of negro life in Harlem. Claude McKay: *Home to Harlem* (Harper) portrays vividly the moral degradation of life among the unsuccessful in Harlem. The author is a gifted negro poet.

Racial Discrimination.—W. E. B. Dubois: *Dark Princess* (Harcourt) is a melodramatic story of a young negro whose career is ruined by racial discrimination. On the same theme, but laid in New Orleans in the middle of the last century, is E. L. Tinker: *Toucoutou* (Dodd, Mead). The interest is chiefly in the picturesque background. Also worthy of notice are Nella Larsen: *Quicksand* (Knopf), the story of a girl of mixed Danish and negro blood, and Du

Bose Heyward: *Mamba's Daughters* (Doubleday).

THE WHITE SOUTH

Tennessee.—Five tales of Southern life stand out from the rest. T. S. Stribling: *Bright Metal* (Doubleday) is an account of life and people in the Tennessee hills. It is a fair treatment of these backward folk, and notable for its "local color." Maristan Chapman: *The Happy Mountain* (Viking) is also laid in Tennessee, and is an idyllic picture of the country and the people. The author makes extensive use of the vernacular of the mountain folk.

Florida, Mississippi, Alabama.—Edwin Granberry: *Strangers and Lovers* (Macaulay) is a story of the poor whites of southern Florida, known as "crackers." Stark Young: *The Torches Flare* (Scribner's) begins in Greenwich Village and ends in a town in northern Mississippi. There is a fine picture of an old Southern household. Jack Bethea: *Cotton* (Houghton) is a dramatic story of the efforts of a scientifically trained man to introduce his methods on an Alabama plantation.

THE WEST

Swedish Immigrants.—A well-received novel in Cornelia Cannon's *Red Rust* (Little, Brown), concerning Swedish immigrants in Minnesota, and their struggle with the soil. Novels on kindred themes are Norman Matson: *Day of Fortune* (Century) and David Grew: *Migration* (Scribner's).

Frontier Life.—Pioneer days of the last century form the setting of Ramsey Benson: *Hill Country* (Stokes), and Bernard De Voto: *House of Sun-Goes-Down* (Macmillan). Thomas Boyd: *Shadow of the Long Knives* (Scribner's) is a readable tale of frontier life before and during the Revolution.

Middle West Scenes.—Fannie Hurst: *A President Is Born* (Harper) is laid in the Middle West forty years hence. Allan Le May: *Old Father of Waters* (Doubleday) is a melodramatic tale of life on the Mississippi before the Civil War.

THE HISTORICAL NOVEL

A number of titles worthy of mention have more or less "historical" settings. John W. Vandercook: *Black Majesty* (Harper) is a romanticized life of Henry Christophe, the slave who became king of Haiti. Manfred Gottfried: *Prelude to Battle* (Day) is an imaginative account of the campaigns and love affairs of Genghis Khan. Daniel Henderson: *The Golden Bees* (Stokes) is a story written around the American wife of Jerome Bonaparte. Theda Kenyon: *Jeanne* (Washburn) somewhat distorts the life of Joan of Arc. Simeon Strunsky: *King Akhnaton* (Longmans) is a story of political life in ancient Egypt, an allegory on the attainment and preservation of peace, with some very plain modern implications.

Elmer Davis: *Giant Killer* (Day) retells with variations the story of King David. E. B. Brunner: *My Wife, Poor Wretch* (Stokes) covers the last months of Samuel Pepys's diary from the point of view of his wife Elizabeth. Laid in the present day are Margaret Wilson: *Daughters of India* (Harper) and Louis Stevens: *All the King's Horses* (Day), the latter a story of aristocratic life in Hungary before and after the World War. There are no outstanding books on the war. Leonard Nason: *Sergeant Eadie* (Doubleday) and James B. Wharton: *Squad* (Coward-McCann) are pictures of doughboy life. Elliott Springs: *Leave Me With a Smile* (Doubleday) and Alan Updegraff: *Whatever We Do* (Day) analyze post-war disillusionment.

ROMANCE AND ADVENTURE

Stories of romance and adventure include H. B. Drake, *Cursed Be the Treasure* (Macy-Masius); Wm. McFee: *Pilgrims of Adversity* (Doubleday); R. W. Chambers: *The Sun Hawk* (Appleton); J. O. Curwood: *The Plains of Abraham* (Doubleday); and Zane Grey: *Nevada* (Harper). For more sophisticated but still relaxed entertainment there are Arthur Train: *Ambition* (Scribner's), a picture of the lawyer's world; Carl Van Vechten: *Spider Boy* (Knopf), gay life in Hollywood; J. P. McEvoy:

Show Girl (Simon & Schuster), the "glorified" American girl; Anita Loos: *But Gentlemen Marry Brunettes* (Boni, Liveright), a sequel to her sensational *Gentlemen Prefer Blondes*. For quieter tastes there are J. C. Lincoln: *Silas Bradford's Boy* (Appleton); Kathleen Norris: *The Foolish Virgin* (Doubleday); Barry Benefield: *A Little Clown Lost* (Century), and Wood Kahler: *Early to Bed* (Knopf).

MYSTERY AND DETECTIVE FICTION

An American review says editorially that "in 1928, every novelist and short-story writer who knew how to spell 'sleuth' wrote at least one detective story," and announces as its slogan for 1929, "fewer and better detective stories." Out of the host of these books, three deserve special mention. S. S. Van Dine: *The Greene Murder Case* (Scribner's) was immensely successful, and criticized only for the affectations of its detective, Philo Vance. K. K. Strahan: *The Desert Moon Mystery* (Doubleday), a Crime Club Book, is a skillfully handled mystery, and in addition written in good style. Frances Noyes Hart: *The Bellamy Trial* (Doubleday) gives a full journalistic account of a murder trial involving a prominent Long Island family in scandal.

Other titles are Eugene Jones: *Who Killed Gregory* (Stokes); John Esteven: *The Door of Death* (Century); F. F. Van de Water: *Hurrying Feet* (Appleton); Herbert Asbury: *The Tick of the Clock* (Macy-Masius); Charles Dutton: *The Clutching Hand* (Dodd, Mead), and J. J. Farjeon: *House of Disappearance* and *Shadows by the Sea* (both Dial). Sketched crimes to be solved by the reader are offered by Johnson and Palmer: *Murder* (Covici) and Wren and McKay: *Baffle Book of Crimes* (Doubleday).

Collections include Carolyn Wells: *American Detective Stories* (Oxford) and W. H. Wright (S. S. Van Dine): *Great Detective Stories* (Scribner's). The straight mystery story, without a detective, is represented by Mary Roberts Rinehart: *Two Flights Up* (Doubleday); Ben Ames Williams: *Dreadful Night* (Dutton); and Abraham Merritt: *Seven Footprints to Satan* (Boni, Liveright). Carolyn Wells also edits a collection of fourteen *American Mystery Stories* (Oxford).

THE SHORT STORY

The best short stories of the year are notable for the sincerity of their art and for their worthwhile themes. Glenway Wescott: *Goodbye, Wisconsin* (Harper) is a collection of beautifully written stories prefaced by a sketch depicting the Wisconsin background. The author brings out the serious and tragic aspects of the life and people hitherto left to the mercies of Sinclair Lewis and Sherwood Anderson. Paul Green: *Wide Fields* (McBride) writes sympathetically of the somber existence of the "poor white trash" of North Carolina. Conrad Aiken: *Costumes by Eros* (Scribner's) is a group of studies of human emotion. The style and method are ultra-modern.

Other collections of merit are Joseph Hergesheimer: *Quiet Cities* (Knopf); Owen Wister: *When West Was West* (Macmillan); Margaret Montague: *Up Eel River* (Macmillan); and Struthers Burt: *They Could Not Sleep* (Scribner's). Anthologies of all kinds abound. Of most general interest are the *O. Henry Book of Prize Stories of 1927* (Doubleday); *The World's Best Short Stories of 1927* (Doubleday); and *The Best Short Stories of 1928*, edited by E. J. O'Brien (Dodd).

MISCELLANEOUS

Honore Willsie Morrow: *With Malice Toward None* (Morrow) is laid in the last two years of the Civil War, and deals with the conflict between Lincoln and Sumner over governmental policy. Esther Forbes: *A Mirror for Witches* (Houghton) is a study in New England witchcraft. Elizabeth Madox Roberts: *Jingling in the Wind* (Viking) is an indescribable bit of phantasy. Meredith Nicholson: *Cavalier of Tennessee* (Bobbs Merrill) is a "novelized" biography of Andrew Jackson, dealing principally with an early love affair, and ending with his election to the Presidency.

AMERICAN POETRY

By William Stanley Braithwaite
Author, Editor and Compiler

CHANGING PUBLISHING CONDITIONS

The year in poetry has been notable in so many ways that it is difficult to comment satisfactorily within the limitations of this article. A condition hardly yet noticeable on the surface is the changing sources of publishing. Not so many years ago practically all the important books of verse were brought out in New York and Boston; and it was the ambition of nearly every American poet to be presented to the public through the publishers of those Eastern cities. Then poets thought it necessary to migrate to New York, as the literary capital, and success could not be envisaged without such a move, even if home and friends had to be left two thousand miles away. Now there are successful poets, poets who have received the enthusiastic approval of metropolitan critics, who have never even visited New York. Ninety per cent of American poets still publish through New York and Boston firms, though only ten per cent of them now are adventuring a literary career in those great centers. Starting with Chicago, which first challenged the literary supremacy of New York, nearly every corner of the country, middle west, the northwest, the Pacific Coast, the southwest, the south, and the south Atlantic coast has some large city with a publishing outlet for the poet's book. This changing condition has been going on in recent years without attracting attention. It is important to note as a progressive element in the widespread interest in the art.

POETRY MAGAZINES

The poetry magazine has been the most influential factor in the conditions noted above. The past year has shown, as in the preceding eight or ten years, an increase of these publications. For every one, which after a brief existence has suspended, on an average two new ones have been launched. Miss Monroe's *Poetry, A Magazine of Verse,* continues to flourish in its seventeenth year, and gives to Chicago the honor of producing the most successful and influential organ for the art. There are some thirty of these publications, and in their distribution throughout the country serve every state in the Union. A good many of the publications are quarterlies, some bi-monthly, and a number monthlies; and the current year has seen the establishment, by Benjamin Musser, editor and proprietor of *Contemporary Verse,* of a weekly, *Japm,* the first of its kind. These poetry magazines, scattered in every section of the country, have, perhaps, as no other force, created a local interest in poetry which has developed the local outlet for books of verse. While many have not a high character of content, they cannot be said to be wholly negligible, because some newcomer often breaks into print in them for the first time, and the encouragement leads to progress which is finally rewarded with a larger market among the better magazines and critical recognition. The better type of the poetry magazines print, without question, the larger proportion of the best poetry published during the year.

COMMERCIAL SUCCESSES IN POETRY

Best Sellers Emerge.—The current year has witnessed the greatest commercial successes that poetry has known for a long time. From Edwin Arlington Robinson's *Tristram* to Robert Frost's *West-Running Brook* there have been some eight or ten books of poems whose total sales must have reached between 300,000 and 400,000 copies. It has been some time since poetry has been in the best-seller lists, but during the past year this has happened to more than one title. Perhaps the poetry-lover is not much different from others who have an interest in certain things but have not the initiative to exercise it. When told to with sufficient force and

repetition they become quite excited and support the interest with great gusto.

Book-of-the-Month Clubs.—There is not much doubt but that the Book-of-the-Month operation has been responsible for the increased circulation of poetry-books; the distribution of Robinson's *Tristram* and Stephen Vincent Benét's *John Brown's Body* together accounted for nearly a hundred thousand copies, and had a tremendous effect in stimulating a further demand for these books, driving *Tristram* well over the 50,000-mark and *John Brown's Body* up to the second hundred thousand. If the Book-of-the-Month organizations were accountable for 100,000 copies of poetry books sold, the difference, up to the nearly 400,000 copies sold, must be credited to the genuine interest of the public in the art.

Outstanding Successes.—Poets with different styles and contents have commanded large sales. Samuel Hoffenstein's "*Poems in Praise of Practically Nothing*," Edna St. Vincent Millay's "*The Buck in the Snow*," Robert Frost's "*West-Running Brook*," and Carl Sandburg's "*Good Morning, America*," have each enjoyed sales of thousands of copies, and books as Elinor Wylie's *Trivial Breath* and George Elliston "*Bright World*" have circulated to the extent that was true of only the most popular poets a decade ago. That the Book-of-the-Month idea would eventually operate in behalf of poetry books, as it has for various specialized types of subjects, was a foregone conclusion, and the successful first year of The Poetry Clan, conducted under the auspices of *Poetry, A Magazine of Verse*, has seen the distribution of *Boy in the Wind*, by George Dillon; *Ballads of a Singing Bowl, Hale's Pond*, by James Whaler; *Outcrop*, by Abbie Huston Evans; *Trivial Breath*, by Elinor Wylie; *Good Morning, America*, by Carl Sandburg; and *The Buck in the Snow*, by Edna St. Vincent Millay. Mark Van Doren's *Anthology of World Poetry* was distributed by The Literary Guild, making the largest selling anthology of the year.

Prize Awards.—For the third time Edwin Arlington Robinson won the Pulitzer Prize for his *Tristram*. The other most important awards for poetry given by *Poetry, A Magazine of Verse*, were The Award of Honor, to Vachel Lindsay; the Helen Haire Levinson Prize, to Elinor Wylie; the Guarantor's Prize, to Marion Strobel; the Young Poet's Prize, to Ted Olson; and the John Reed Memorial Prize, to Elizabeth Madox Roberts.

POET AND POETRY CLASSIFICATIONS

The Individual Message.—We can no longer classify the writings of American poets into groups or schools as the case was a few years back. The mode of the *Others* group,—the imagists, the realists, the poets with a "social conscience,"—seem all to have merged into a pattern where only the individual quality of the poet counts. Whatever message a poet has is the expression of his or her peculiar way of seeing life and nature, without the desire to consolidate moods or methods into a program. Because there is no longer a battle-cry among poets, something of the stimuli of a decade ago seems gone. It is merely that the agitation is not discernible on the surface of æsthetic and emotional conflict. The results of the conflict for "tendencies" and "form" of a decade ago has, as a group or school movement, been futile; and over the first flush of sensational public interest in the art in modern America, the poets have arrived at the conviction that poetry in essence is spirit, and that the function of the poet is to express that spirit through any subject which produces an appealing rhythm. The message is what the poet makes of his individual understanding of experience, the problem being to transmute his understanding whether subjective or objective, into those symbols which his power can make the most convincing.

Benét and Millay.—Stephen Vincent Benét makes an epical canvas out of the events and personages of the Civil War, and renders his own interpretation of the event or the

characters; while Edna St. Vincent Millay, with a passionate subjectivity, in *The Buck in the Snow*, expresses those personal emotions springing from the love, fear, hope or sorrow of her own heart. Yet in both there is an undoubted universality of experience. And both, as typical of all poets worth the name, strive for the ultimate in beauty and music.

MacLeish and Crane.—In spite of what is stated in the foregoing, there are a number of poets whose value it is hard to determine since practically all are in the promissory stage of development. Archibald MacLeish and Hart Crane represent this class at its best. They attempt to solve the enigma of life purely through the intellect; in other words, they are philosophers and psychologists who have taken to the medium of verse for the subtle analysis of the obscure workings of human experience. The most provocative volume of this type published during the year was *The Hamlet of A. MacLeish*, by Archibald MacLeish. These poets strive to escape from the three dimensional sphere of existence, and are a puzzle to readers and critics.

Robinson Jeffers.—As subtle, but nevertheless comprehensible, is Robinson Jeffers, who, though he often puzzles his readers and critics, does so within the negotiable world in which we live. Undoubtedly, Mr. Jeffers is one of the few great contemporary American poets, and his volume of the year *Cawdor* has even a larger measure of power and beauty and destructive passion than the earlier *Tamar*.

Current Implications.—The ethical implications which were so damaging to the artistry of most of the better-known American poets of the last century no longer dominate meaning in the current production of verse. Truth to idea rather than truth to object; contemplation of nature as a storehouse of energy for the mechanism of living, sex as a rational experience exerting its influence and threading the very constitution of existence rather than a feverish mystery,—these things no longer propagate a message for the contemporary poet, but are rather so much stimuli for the creation of poetry that has color, music and symbol.

NEW POETS AND NEW POETRY

Contributions of Note.—The year has been exceedingly rich in volumes of poems worthy of a permanent place on the shelves of all cultured persons, besides the books referred to in the above commentary. *Now the Sky and Other Poems*, by Mark Van Doren, is a decided advance in the style in which this poet has directed his art in previous collections; *Star Dust and Stone*, by Glenn Ward Dresbach, who is rapidly forging to the front among American poets; *The Seventh Hill*, by Robert Hillyer, whose grave music is steadily gaining a widespread recognition; *Aphrodite*, by Wallace Gould, the second collection of a poet too much neglected; *Lost Address* by Chard Powers Smith, *Jealous of Dead Lovers* by Shaemas O'Sheel, *Heavenly Bodies* by Oliver Jenkins, *Kanaka Moon* by Glifford Gessler, and the *Collected Poems* of William Ellery Leonard are among the noted contributions to the year's output.

New Poets.—Several new poets have been introduced to the public this year whose future promise distinctive achievement. Of these Elizabeth Hollister Frost has had a most auspicious beginning, her volume, *The Lost Lyrist*, having exhausted its first edition within a few weeks of publication. James Whaler, whose *Hale's Pond* presented a new narrative poet, won immediate approval of the critics, though the public has been slower in its appreciation. Marjorie Meeker is another first-book poet of the year enriching the art with an exquisite symbolic gift. Abbie Huston Evans possesses a sterner note in *Outcrop*, and Ted Olson in *A Stranger and Afraid* offers a collection of his poems which have appeared in various magazines the past six or eight years.

OBITUARY

Elinor Wylie.—The sudden death of Elinor Wylie in December takes from American literature a brilliant

personality. With her first book of poems, *Nets to Catch the Wind*, she took a foremost place among American poets, and the three novels she had published won her an honored position in recent fiction.

CRITICISM AND BELLES LETTRES

By Albert R. Elsasser

Professor, Princeton University

LITERARY CRITICISM

Works that fall strictly in the fields of philosophy, psychology, sociology, art, education, and research scholarship, being treated elsewhere in this volume, are omitted from the present article. Preference has been given, under the several headings, to books of general rather than of limited appeal.

Essays in the American Field.—An event of importance is the appearance of the first volume of a new series of Shelburne Essays by Paul Elmer More, entitled *The Demon of the Absolute* (Princeton Univ. Press). The volume is devoted chiefly to an analysis of contemporary American literature. T. K. Whipple: *Spokesmen* (Appleton) is a series of essays on nine contemporary American writers, studied against a sociological background. This book is almost paralleled in subject-matter by eight essays from the London Mercury collected in *Contemporary American Authors* (Holt). Regis Michaud: *The American Novel of Today* (Little, Brown) studies the subject as an expression of American psychology. Norman Foerster: *American Criticism* (Houghton) is an analysis of the literary creeds of such writers as Poe, Emerson, Lowell, and Whitman.

Other critical works by Americans, but not limited to the American field, include Ernest Boyd: *Literary Blasphemies* (Harper), presenting violent attacks on the reputations of various writers from Shakespeare to Whitman and Hardy; and Ludwig Lewisohn: *Cities and Men* (Harper, late 1927), a collection of essays on literary men, Americans and European, past and present. Grant Overton writes on *The Philosophy of Fiction* (Appleton), John Erskine on *The Delight of Great Books* (Bobbs-Merrill), and J. O. Bennett on *Much Loved Books* (Boni, Liveright). P. S. Allen and H. M. Jones: *The Romanesque Lyric* (Univ. of N. Car. Press) is a comprehensive study of the medieval lyric deriving from Roman verse, with a number of translations. Robert M. Gay: *Emerson* (Doubleday) is a brief biography and interpretation, with frequent quotations from Emerson.

THE HISTORY OF CULTURE

Current Estimates. — Struthers Burt: *The Other Side* (Scribners) refutes some current depreciations of American life. Booth Tarkington: *The World Does Move* (Doubleday) discusses in an entertaining manner the enormous changes in American customs and behavior in the last four decades. Two symposia covering many aspects of American life are *Recent Gains in American Civilization* (Harcourt) edited by Kirby Page, and *Freedom in the Modern World* (Coward-McCann) edited by H. M. Kallen. W. B. Pitkin: *The Twilight of the American Mind* (Simon, Schuster) "views with alarm" the threatened over-supply of trained minds. *Mirrors of the Year* (Stokes) is an anthology of essays on subjects of current interest.

Studies of the past include Howard Mumford Jones: *American and French Culture* (Univ. of N. Car. Press), a comprehensive review of the influence of French life and ideas in this country from 1750 to 1848; and Gilbert Seldes: *The Stammering Century* (Day), a record of the activities of religious and communistic fanatics during the last century. This book is supplemented by Charles W. Ferguson: *The Confusion of Tongues* (Doubleday), a discussion of "odd re-

ligions" today. The modern scientific spirit is the theme of Henry Fairfield Osborn: *Creative Education* (Scribners). *Creative Intelligence and Modern Life* (Univ. of Colorado) is a symposium. Roland B. Dixon: *The Building of Cultures* (Scribners) criticizes current dogmas about the origin and spread of culture.

THE LITERARY ESSAY

Zona Gale: *Portage, Wisconsin* (Knopf) is a collection of essays, some descriptive and some critical. The title-essay reproduces intimately life and manners in a middle Western town. G. M. Harper: *Spirit of Delight* (Holt) is a charming collection of essays on literary and general subjects, by the Woodrow Wilson Professor of English at Princeton University. Other titles are: Samuel McChord Crothers: *Thought Broker* (Houghton), six essays on a variety of topics; Walter Hinchman: *Pedestrian Papers* (Houghton); and Felix Riesenberg; *Shipmates* (Harcourt), consisting of short sketches on seamen and the sea. Glenway Wescott prefaces *Goodbye, Wisconsin* (Harper), a collection of stories, with an essay that gives its title to the book. Stuart P. Sherman: *Shaping Men and Women* (Doubleday) is a posthumous collection of essays, lectures, and addresses written at various times by a distinguished critic and teacher. Other collections worthy of notice are Christopher Morley: *Essays* (Doubleday), selected from his previous volumes; *Essays of Today, 1926-1927* (Century), edited by Odell Shepherd and Robert Hellyer; and *Contemporary Essays* (Houghton), edited by W. T. Hastings, chosen from English and American writers.

BOOK COLLECTING

Two works on rare books are William Dana Orcutt: *The Kingdom of Books* (Little, Brown), a richly illustrated volume on fine types and bindings, and Douglas Crawford McMurtrie: *The Golden Book* (Covici), a full history of fine book-making compiled by an eminent authority. For the guidance of the collector are A. Edward Newton: *This Book Collecting Game* (Little, Brown), a group of gossipy essays by an enthusiastic bibliophile, and John T. Winterich: *Collector's Choice* (Greenberg), supplementing the author's *Primer of Book Collecting.*

MISCELLANEOUS

William Romaine Newbold: *Cipher of Roger Bacon* (Univ. of Penna. Press) sets forth Dr. Newbold's working out of the intricate cipher of the Voynich Manuscript. Gamaliel Bradford: *Life and I* (Houghton), a "psychograph" of Everyman, deals with problems of modern life. Joseph Collins: *The Doctor Looks at Marriage and Medicine* (Doubleday) is sufficiently described by its title. Clara Barrus edits *The Heart of Burroughs's Journals* (Houghton). Edmund Pearson: *Queer Books* (Doubleday) is an entertaining account of literary curiosities of the past.

ENGLISH LANGUAGE AND LITERATURE

By Albert C. Baugh

Professor of English, University of Pennsylvania

GENERAL SURVEY

The present survey of American research in the field covered, like its predecessors, is selective. Many studies concerned with details too technical for the layman are omitted although they are often of considerable importance to the philologist and the literary historian. A complete list of such contributions will be found in the author's bibliography in the March issue of the *Publications of the Modern Language Association* (*PMLA*).[1] The reader should also con-

[1] Periodicals are cited under the following abbreviations, the reference being always to the volume for the year covered by this review:—*PMLA, Publications of the Modern*

sult J. P. Willard's *Progress of Medieval Studies in the United States* (Boulder, 1928), Hardin Craig's "Recent Literature of the English Renaissance" (*SP*), and R. S. Crane's "English Literature, 1660-1800: A Current Bibliography (*PQ*), the last two of which include foreign as well as American work.

Among new books on literary criticism and the appreciation of literature the reader will find Louise Dudley's *The Study of Literature* readable and suggestive. Van Meter Ames's *Aesthetics of the Novel* is somewhat popular in tone. R. D. O'Leary's *The Essay* is a comprehensive discussion of the essay as a type, —its substance, structure, style, etc. For those interested in the study of folk-lore and popular literature Stith Thompson's *The Types of the Folk-Tale: A Classification and Bibliography* is indispensable for reference.

George H. McKnight in a book of nearly 600 pages, called *Modern English in the Making*, has given a detailed account of the English language from the fourteenth century to the present day. The method is descriptive and much illustrative matter is introduced. *The Psychology of Language* by Walter B. Pillsbury and Clarence L. Meader is an interesting and valuable product of collaboration between a linguistic scholar and a psychologist.

OLD ENGLISH LITERATURE (450-1150)

The most important contribution to Old English scholarship of the year is W. W. Lawrence's *Beowulf and Epic Tradition*, an attempt to embody the results of recent Beowulf scholarship and the author's own researches in a book intelligible to the general reader. In what is probably his last contribution. In "Aldhelm's 'Rude Infancy'" (*PQ*), the late Professor Albert S. Cook interprets an ambiguous phrase in one of Aldhelm's letters. M. D. Clubb offers some bibliographical and paleographical observations on "The Second Book of the 'Caedmonian' Manuscript" (*MLN*), Kemp Malone argues for the interpretation of "Hunlafing (*MLN*) in *Beowulf* as a sword, and R. L. Greene suggests "A Rearrangement of Christ and Satan" (*MLN*), transposing sections II and III of the poem to restore the Biblical sequence of events.

MIDDLE ENGLISH LITERATURE (1150-1500)

General.—Among works on the Middle Ages important as a background to Middle English Literature a high place should be given to E. K. Rand's *Founders of the Middle Ages*, lectures given in the early part of the year at the Lowell Institute. P. S. Allen has gathered together in book form his work on medieval Latin poetry, under the title *The Romanesque Lyric: Studies in its Background and its Development from Petronius to the Cambridge Poets (50-1050)*. Margaret Schlauch's *Medieval Narrative: A Book of Translations* is a useful collection. C. S. Baldwin's *Medieval Rhetoric and Poetic (to 1400)*, *Interpreted from Representative Works* and M. W. Bundy's *The Theory of Imagination in Classical and Medieval Thought* (Illinois) throw much light on medieval literary theory.

Folk-Lore and Romance.—A. H. Krappe's *Balor with the Evil Eye: Studies in Celtic and French Literature* contains some interesting contributions to medieval literature and folk-lore. Archer Taylor's *The Black Ox: A Study in the History of a Folk-tale* is a valuable study of folk-tale transmission and a good example of modern folk-lore method. In the field of romance R. S. Loomis's "Geoffrey of Monmouth and Arthurian Origins" (*Speculum*) is written with grasp and conviction. Kemp Malone's "Rose and Cypress" (*PMLA*) studies an oriental analogue of Arthur and Gorlagon, Robert Jaffray's *King Arthur and the Holy Grail* is a popular survey. C. S. Slover's *Early Literary Channels be-*

Language Association of America—MP, Modern Philology—MLN, Modern Language Notes —MLR, Modern Language Review—JEGP, Journal of English and Germanic Philology—SP, Studies in Philology—PQ, Philological Quarterly—RES, Review of English Studies —RR, Romanic Review. Titles appearing as theses or in the publications of universities are followed where possible by the name of the university.

tween Ireland and Britain (Texas), the first part of which was published last year, strengthens the argument for Irish influence in medieval romance. Adelaide E. Harris has written on *The Heroine of The Middle English Romances* (Western Reserve) and J. S. P. Tatlock, in "The Modern Reader's King Horn," has made a spirited verse translation for the *University of California Chronicle*.

Biographical.—Hope E. Allen's monograph *Writings Ascribed to Richard Rolle, Hermit of Hampole, and Material for His Biography* appeared last year too late to be included in the 1927 survey and is too important not to be mentioned. Roscoe E. Parker has edited for the Early English Text Society *The Middle English Stanzaic Versions of the Life of Saint Anne*. Oscar Cargill and Margaret Schlauch attack the old problem of *The Pearl*. In "The Pearl and Its Jeweler" (*PMLA*) they suggest that the poem is an elegy written on the death of Margaret, granddaughter of Edward III. Fred'k. E. Faverty discusses the "Legends of Joseph in Old and Middle English" (*PMLA*).

Chaucer.—Professor J. M. Manly has published his selection from the *Canterbury Tales*, provided with an introduction and notes of great value. He has also published in The English Association's *Studies* "Sir Thopas: A Satire." A number of documents bearing on the life of Chaucer, turned up in the search directed by Mr. Manly and Miss Edith Rickart, and have been printed in *Modern Philology* and the *London Times Literary Supplement*.

Drama.—Several contributions to the study of the medieval drama have been made. Grace E. Clark in "The York Plays and the Gospel of Nicodemus" (*PMLA*) dates two of the plays in the cycle between 1400 and 1415. Louis Wann offers notes based on "A New Examination of the Manuscript of the Towneley Plays" (*PMLA*) and Francis A. Foster answers in the negative the question "Was Gilbert Pilkington Author of the *Secunda Pastorum*?" (*PMLA*). Anna J. Mill's *Medieval Plays in Scotland* (St. Andrews University) is a most important collection of records of performance and other documents.

Ballad studies of the year include L. C. Wimberly's *Folklore in the English and Scottish Ballads* and contributions by various collectors of versions of Old English ballads found in America, the latter in the *Journal of American Folk-Lore*. An important contribution to Fifteenth Century literature is Edward Hicks's *Sir Thomas Malory: His Turbulent Career. A Biography*. Through records of law-suits in which Malory was involved Hicks has been able to make a recognizable figure out of a mere name. L. L. Tucker and A. R. Benham have compiled *A Bibliography of Fifteenth Century Literature, with Special Reference to the History of English Culture* (University of Washington).

MODERN ENGLISH LITERATURE (SINCE 1500)

Poetry and Drama.—The first important book of modern English poetry, *Tottel's Miscellany*, is being edited by H. E. Rollins in a beautifully printed edition. Leicester Bradner finds in the collection the "Forerunners of the Spenserian Stanza" (*RES*). In drama Willard Thorp has written a dissertation on *The Triumph of Realism in Elizabethan Drama, 1558-1612* (Princeton). Samuel A. Tannenbaum in *The Assassination of Christopher Marlowe, A New View*, points out the weakness in the coroner's report and the testimony which he accepted, and concludes that Marlowe was the victim of premeditated murder. Roberta F. Brinkley's *Nathan Field, the Actor-Playwright* is a Yale dissertation. A new volume (the twentieth) has appeared in the Variorum Shakespeare, *Coriolanus*, edited by Horace Howard Furness, Jr. Robert M. Smith's *The Variant Issues of Shakespeare's Second Folio and Milton's First Published English Poem: A Bibliographical Study* (Lehigh) is the first adequate description of the nine variant issues of the Second Folio. Ruth L. Anderson, in *Elizabethan Psychology and Shakespeare's Plays* (Iowa), attempts to

determine the treatment of the passions in Elizabethan times with a special view to the interpretation of Shakespeare. A. K. Gray in "Shakespeare and Titus Andronicus" (*SP*) maintains Shakespeare's authorship of the play and supports his contention by parallels in *Venus and Adonis* and *Lucrece*, written at the same time.

Milton and Others.—*Milton on Education* is a Cornell dissertation by O. M. Ainsworth, in which the *Tractate* is edited with copious illustrative extracts from Milton's other writings. James H. Hanford in "The Manuscript of Paradise Lost" (*MP*) shows that the transcript of the first book now in the Pierpont Morgan Library was the copy from which the 1667 edition was set up. John W. Draper has brought out two books on the elegy, *The Funeral Elegy and the Rise of English Romanticism* and *a Century of Broadside Elegies*, the latter a sumptuous volume of one hundred broadsides photographically reproduced and edited with introduction and notes. *Richard Brathwait: An Account of His Life and Works* is a Pennsylvania dissertation by Matthew W. Black. Theodore H. Banks has edited *The Poetical Works of Sir John Denham*. Leslie Hotson has broken new ground in *The Commonwealth and Restoration Stage*, which embodies the results of important discoveries in the Public Record Office. William S. Clark returns to Scott's view that "The Sources of the Restoration Heroic Play" (*RES*) are to be found in the heroic romances of the period. Paul S. Wood traces "The Opposition to Neo-Classicism in England between 1660 and 1700" (*PLMA*).

The eighteenth century continues to hold the interest of students. James T. Hillhouse classifies and discusses the contents of the *Grub-Street Journal*, a rich storehouse of material on English manners of the period. Marjory Bailey has edited *The Hypochondriack: Being the Seventy Essays by the Celebrated Biographer, James Boswell, Appearing in the London Magazine from Novemmer, 1777, to August, 1783, and Here First Reprinted*. Percival Merritt tells *The True Story of the So-called Love Letters of Mrs. Piozzi: In Defense of an Elderly Lady;* and R. C. Alexander edits for the first time from the original MS. *The Diary of David Garrick*. Willard Thorp's "The Stage Adventures of Some Gothic Novels" (*PMLA*), Edith Wray's "English Adaptations of French Drama between 1780 and 1815" (*MLN*), and R. C. Whitford's "Juvenal in England 1750-1802" (*PQ*) suggest their subjects in their titles.

Nineteenth Century.—In the literature of the nineteenth century H. T. Stephenson's *The Ettrick Shepherd: A Biography* (Illinois) may be put first for chronological reasons. In *John Keats and Mary Tighe* E. V. Weller prints Mrs. Tighe's *Psyche and Other Poems* with parallel passages from Keats to show the latter's indebtedness to his lesser contemporary. P. F. Baum has prepared a critical edition of *Rossetti's The House of Life*. Arthur Caplon has compiled a *Bibliography of Sir Walter Scott, Bart.* and William Reitzel has shown that "Sir Walter Scott's Review of Jane Austen's *Emma*" (*PMLA*) was written not by Scott but by Archbishop Whateley.

Miscellaneous.—A few titles of more general character must complete this survey. Dix Harwood's *Love For Animals: And How It Developed in Great Britain* is really a study in English literature. H. N. Fairchild's *The Noble Savage* is, as its subtitle indicates, a study in romantic naturalism. Finally two stimulating collections of essays which take literature as their point of departure deserve mention: George M. Harper's *Spirit of Delight* and Cornelius Weygandt's *Tuesdays at Ten*.

GERMANIC LANGUAGES AND LITERATURE

By Friedrich Bruns

Professor, University of Wisconsin

Middle High German Period.—The new spirit or method of literary studies evident for some decades in works dealing with the more modern period of German literature is now beginning to bear fruit in works dealing with the older or Middle High German period. Gottfried Weber has finished volume I of *Wolfram von Eschenbach.* Bd. 1. *Stoff und Form* (Frankfurt, Diesterweg. — Deutsche Forschungen Bd. 18). Emil Walker has investigated the monologue in the court epic: *Der Monolog im höfischen Epos.* (Stuttgart: Kohlhammer), while Hennig Brinkmann writes *Zu Wesen und Form mittelalterlicher Dichtung* (Halle, Niemeyer).

The important works of a more general nature are: Carl Diesch; *Bibliographie der germanistischen Zeitschriften* (Leipzig; Hiersemann), Hans von Müller; *Zehn Generationen deutscher Dichter und Denker,* a sort of guide through the monumental work of K. Goedeke (Berlin: Frankfurter Verlagsanstalt). Leo Spitzer has published two volumes of *Stilstudien: 1. Sprachstile. 2. Stilsprachen* (München: Hueber). Edwin Roedder (University of Wisconsin) gives a folk-loristic account of his native village in Baden: *Das südwestdeutsche Reichsdorf in Vergangenheit und Gegenwart* (Lahr, Schauenburg). The *Geschichte der deutschen Literatur,* etc., by W. Kosch and the *Reallexikon,* etc., by Merker und Stammler (see preceding volumes of American Year Book) have progressed at a good rate. Rudolf Bosch discusses the problem of literary evaluation: *Die Problemstellung der Poetik* (Leipzig: L. Voss).

The Modern Period.—K. Viëtor discusses *Probleme der Barockliteratur* (Leipzig: Weber); Benjamin Walter, *Ursprung des deutschen Trauerspiels* (Berlin: Rowohlt); H. Bühnemann characterizes Elias Schlegel and Wieland in their attitude to ancient tragedy, *E. S. und W. als Bearbeiter antiker Tragödien* (Leipzig: Eichblatt). Josef Clivio discusses Lessing as a critic of tragedy, Max Wedel, Herder in general; *Lessing und das Problem der Tragödie* (Zürich: Münster-Presse); *Herder als Kritiker* (Berlin: Ebering).

Goethe and His Circle.—A number of works deal with Goethe and his circle. A second volume of H. A. Korff's *Geist der Goethezeit* is the most significant. A. Weichberger has investigated Goethe's attitude to the stage, *Goethe und das Komödienhaus in Weimar,* 1779-1825 (Leipzig: L. Voss). K. Bahn gives a short biography of Marianne von Willemer (Berlin, B. Eher), and H. H. Houben has completed his life of J. P. Eckermann (2 vol., Leipzig: Haessel). The metaphysical background of Schiller's tragedy is the subject of F. A. Hohenstein's book, *Schiller, Die Metaphysik seiner Tragödie* (Weimar: Böhlau). The book of Fritz Strich, *Deutsche Klassik und Romantik* has been enlarged and revised in a third edition (München: Meyer & Jessen). A volume of Strich's essays has been published by the same firm: *Dichtung und Zivilisation.*

German romanticism seems to attract unabated interest. Eva Fiesel treats *Die Sprachphilosophie der deutschen Romantik* (Tübingen: Mohr), Benno von Wiese discusses the trend of Romanticism towards Catholicism, Friedrich Schlegel, *Ein Beitrag zur Geschichte der romantischen Konversionen* (Berlin: Springer). W. Böhm, well known as the editor of the first good edition of Hölderlin, gives us what promises to be the really authoritative biography of this poet, to be completed in two volumes (Halle: Niemeyer). Hermann Pixberg discusses the philosophy of Novalis: *Novalis als Naturphilosoph* (Gütersloh: Bertelsmann), H. O. Burger has written a monograph on the circle around Uhland, *Schwäbische Romantik* (Stuttgart:

Kohlhammer). A bibliography of E. T. A. Hoffmann by Gerh. Salomon has appeared in a second enlarged edition (Berlin: Paetel).

The Post-romantic Writers.—We have a *Biography of Adalbert Stifter* by Josef Bindtner (Wien: Strache); the *Correspondence of G. Keller with Marie and Adolf von Exner* (Wien: Speidel) and *Biographies of T. Fontane* (Wittenberg: Ziemsen) and *Gustav Falke* (Braunschweig: Westermann), both by Heinrich Spiero, who also has made a *Raabe-Lexikon* (Berlin: Klemm). August Schröder offers *Kritische Studien zu den Gedichten C. F. Meyers* (Köln: Gehly). Paul Zincke has a *Monograph on P. Heyses Novellentechnik* (Karlsruhe: Gutsch). Rudolf Gottschalk and Friedrich Schmidt deal with Spitteler, the former *Spitteler* (Zürich: Rascher), the latter *Die Erneuerung des Epos* (Leipzig: L. Voss). The religion of G. Hauptmann is the subject of a study by Erwin Langner, *Die Religion G. Hauptmanns* (Tübingen: Mohr). The collected letters of Carl Hauptmann have been edited by W. E. Peuckert under the title *C. H.—Leben mit Freuden* (Berlin: Horen). There are two new monographs on Thomas Mann: Martin Havenstein, *T. M.—Der Dichter und Schriftsteller* (Berlin: Wiegandt und Grieben), and Max Kappi, *T. M. novellistische Kunst* (München: Drei Masken). Harry Slochower has a book on R. Dehmel, *R. D. Der Mensch und der Denker* (Dresden: Reissner). There are three monographs on R. M. Rilke: (1) a biography by Lou Andreas-Salome, *R. M. R.* (Leipzig: Insel); (2) Gert Buchhert, *R. M. R.* (Zürich: Rascher); (3) a special number of the periodical *Orplid.* The letters of Walter Flex have been edited by Konrad Flex: (München: Beck). The language of impressionism is the subject of a study by Luise Thon, *Die Sprache des deutschen Impressionismus* (München: Hueber). Erwin Rieger evaluates the life and work of Stefan Zweig in his account: *S.Z. Der Mann und das Werk* (Berlin: Spaeth).

ROMANCE LANGUAGES AND LITERATURE

By George L. Hamilton

Professor, Cornell University

FRENCH

Medieval Period.—Three critical editions have been published by American scholars: *Le Roman de la Violette*, by D. Buffum, *La Passion Provençale*, by W. F. Shepard, in the publications of the *Société des Anciens Textes Français*, and *Le Roman de l'estoire dou Graal*, by W. A. Nitze, in the *Classiques Français du Moyen Âge*. E. S. Murrell has presented a useful new text in "The death of Tristan, from the Douce MS. 189." *PMLA*. 343-383, and J. T. Lister has printed after one manuscript *La Grans Proiere Nostre Dame*, *RR*. 115-129.

U. T. Holmes finds a modern Arabic custom for "The Saracen oath in the Chansons de Geste," *MLN*. 84-87, while L. E. Loomis and T. P. Cross find conclusive evidence of Celtic elements in the French epic, in their "Observations on the *Pèlerinage Charlemagne*, *MLN* 331-354. In "Calogrenanz and Crestien's Originality," *MLN*. 215-222, R. S. Loomis equates the companion of Kay with Kay himself, and in "Gawein, Gwrl and Cuchullin," *PMLA*. 384-396, he equates those three semi-mythological heroes. H. Muchnic in "The Coward Knight and the Damsel of the Car," *PMLA*. 323-342, discusses a difficult episode in the *Perlesvaus*. L. E. Winfrey points out new French sources in "Kaherdin and Camille: the sources of Eilhart's *Tristram*," *MP*. 257-267.

In writing on "Ritson's *Life of King Arthur*, *PMLA*. 251-287, A. B. Hopkins points out how often the inspired guesses of that learned and brilliant if erratic scholar, coincide with the results of recent investiga-

tions in the same field. R. L. Hawkins has studied with good results "The Manuscripts of the *Roman de la Rose* in the Libraries of Harvard and Yale Universities," *RR.* 1-24, while R. T. Holbrook in "Guill-Alecis et *Pathelin*," *UCSMP.* xiii, 285-412, finds new evidence for accepting Cons's suggestion as to the authorship of the famous farce, certain difficulties of which he has elucidated in his "Pour le Commentaire de *Maistre Pierre Pathelin*," *Romania,* LIV, 66-98. A. H. Krappe brings to a conclusion his important "Studies on the *Seven Sages of Rome*, *AR.*, XI. 592-603, and supplies a full commentary on an allusion in Villon to "The Legend of Buridan and the Tour de Nesle," *MLR.* 216-22. T. G. Wessenberg has summed up the usages and rules in regard to "The Case of the Predicate Complement After Reflexive Verbs in Old French," *MLN.* 11-17.

Modern Period.—G. L. Michaud has studied "The Spanish Sources of Certain Sixteenth-Century French Writers," *MLN.* 157-163, while S. L. Levengood devotes a book to "*The Use of Color in the Verse of the Pleiade*, Paris, Presses Universitaires, pp. 124. B. Matulka treats *The Cid as a Courtly Hero, from the Amadis to Corneille,* Columbia University Press, pp. 54. Important contributions based on new material are to be found in G. R. Havens, "Voltaire's Marginal Comments upon Pope's *Essay on Man*," *MLN.* 429-439, and N. L. Torrey, "A Note on Voltaire's *Commentaire Historique*," *MLN.* 439-442, while two source studies are to be found in T. E. Oliver, *The Merope of George Jeffreys as a Source of Voltaire's Merope,* pp. 111, *Univ. of Illinois Studies in Language and Literature,* vol. xii, No. 4, and E. E. Rovillain, "Sur le *Zadig* de Voltaire; Quelques Influences Probables," *PMLA.* 447-455. A. Schinz has written a penetrating study on *La Pensée Religieuse de Rousseau et Ses Récents Interprètes,* pp. 52, *Smith College Studies in Modern Languages,* vol. VIII.

A well-conceived and well-written book is F. C. Green's *French Novelists, Manners and Ideas from the Renaissance to the Revolution,* London, pp. xi, 239, one phase of which he has discussed in "The Eighteenth-Century French Critic and the Contemporary Novel," *MLR.* 174-187, while another phase has been treated by F. H. Wilcox, "*Prévost's Translation of Richardson's Novels*," *UCSMP.* XII, 341-411, while another study in cosmopolitanism is H. Ronmiguière, "Le Français dans les Relations Diplomatiques," *Ib.*, 412-4. A. Lacey has written on *Pixerécourt and the French Drama,* University of Toronto Press, pp. 88, while H. Norman deals with the wider theme, *Swindlers and Rogues in French Drama,* Univ. of Chicago Press, pp. xx, 259.

J. N. Ware discusses at length *The Vocabulary of Bernardin de Saint-Pierre and its Relation to the French Romantic School,* Johns Hopkins Studies in Romance Literatures and Languages, VIII. pp. 120. G. Chinnard writes on "Quelques Origines Littéraries de *René*," *PMLA.* 288-302, and E. Malakis has summed up "Chateaubriand's Contributions to French Phil-hellenism, *MP.* 91-105. The sources of some of the great French realist's conceptions and characters are the subject of articles by J. F. Jackson, "Bonald and Balzac," *PMLA,* 456-462, F. M. Warren, "Was Balzac's *Illusions perdues* Influenced by Stendhal?", *MLN.* 179-180, and G. M. Fess, "*Les Employés and Scènes de la Vie Bureaucratique*," Ib., 236-242. R. L. Hawkins has published some important "Unpublished Letters of Alexis de Tocqueville," *RR.* 195-217. L. P. Shanks has summed up in an acceptable way information about *Flaubert's Youth,* Johns Hopkins Press, xi, 246, while E. M. Grant in his *French Poetry and Modern Industry (1830-1870),* Harvard University Press, pp. viii, 218, has given a brilliant exposition of what would seem, at first sight, the curious correlation of two such diverse phases of life.

SPANISH

The most important contributions in Spanish are G. T. Northrup's critical edition of *El Cuento de Tristán de Leonís,* Univ. of Chicago Press. pp. 298, and W. W. Sturdevant's *The Misterio de Los Reyes Magos:*

Its Position in the Development of the Medieval Legend of the Three Kings, Johns Hopkins Studies in Romance Literatures and Languages, VIII, pp. 120. A. G. Solalinde has studied "El Juicio de Paris en el 'Alexandre' y en la 'General Estoria,'" *Revista de Filología*, XV, 1-51, showing the indebtedness of the latter to the former work for the chief outline of the story. Under the title of *Gongorism and the Golden Age: A Study of Exuberance and Restraint in the Arts*, Univ. of N. Carolina Press, pp. xvi, 275, E. K. Kane delivers himself of an attack on exaggerated tendencies in art and literature. F. C. Tarr has analysed and discussed the sources of the "*Duende satirico del dia of Larra*," *MP.* xxxvi, 31-46. A. M. Espinosa returns to earlier extensive studies in "La Sinalefa y la Compensaciónen la Versificación Española," *RR.* 289-301.

ITALIAN

The most noticeable contribution is the completion of M. Books's edition of the *Libro del Poema Chimato Choamato Città di Vita Composto da Matteo Palmieri Fiorentino, Smith College Studies in Modern Languages*, IX, pp. 268. C. H. Grandgent writes a note on "Vele di Mar," *Annual Reports of the Dante Society*, Cambridge, pp. 1-10, and A. H. Krappe, "Notes on Dante's *Inferno*," *AR.* 592-603.

LATIN LITERATURE

By John C. Rolfe

Professor, University of Pennsylvania

Linguistics and Grammar.—Some knowledge of Linguistics, including Etymology, should form the backbone of the study of any language. For the classical scholar it is indispensable for many reasons, one of which is that it gives a clearer understanding of the relation of Latin to the Romance Languages and to other modern tongues, including English. In this connection the following articles are timely: "Linguistic Science and Classical Philology," by E. H. Sturtevant and R. G. Kent, *C.W.* xxii, pp. 9 ff.; "Phonetic Laws," by E. H. Sturtevant, *C.J.* xxiii, pp. 258 ff.; "Some Latin Words and their Ways," by N. DeWitt, *C.J.* xxiii, pp. 645 ff. Less than a generation ago, the contributions of American scholars to our subject were largely in the domain of grammar, and particularly of syntax. At present such contributions are very decidedly in the minority. E. A. Hahn writes of "The *ab urbe condita* Type of Expression in Greek and English" in *C.J.* xxiii, pp. 266 ff., and H. C. Nutting, at frequent intervals, contributes notes on various points of grammar, such as "the *cum*-construction," "the ablative with *fretus*," and "the *utor, fruor, fungor* group," explaining them by the facts of Latin usage rather than by speculation as to their genesis in primitive Indo-European (see *U.C.* volumes 8 and 10, *passim*).

Relation to Modern Civilization.—To *D.G.R.* are now added *Greek Rhetoric and Literary Criticism*, by W. Rhys Roberts, and *Psychology*, by G. S. Brett. A revised edition of *Latin and Greek in American Education* has been issued by H. A. Sanders and E. S. McCartney as a memorial of their former colleague, the late F. W. Kelsey, to whose enthusiasm the book, with its "Symposium on the Value of Humanistic Studies," was oriinally due. This volume containing, among others, Shorey's masterly article on "The Case for the Classics," may fairly be said to close the argument for the defense. The evidence is all presented and it is simply a question of accepting or rejecting it. Since many of the opposition ignore the evidence, we may still welcome from the pen of a Professor of Chemistry testimony to the value of the study of the classics to a scientist (see A. E. Hill in *C.J.* xxiii, pp.

241 ff.). Other articles under this general head are: "A Classical Background for Fascism," *C.J.* xxiii, pp. 668 ff., by A. P. Wagener, who finds parallels between Italy of to-day and the later days of the Roman republic; "Tanks and Roman Warfare," by L. K. Born, who writes of the use of elephants, first by Pyrrhus and by the Carthaginians, and then by the Romans (*C.J.* xxiii, pp. 564 ff.); and "The Attack on Gergovia," by L. MacVeigh, in *C.W.* xxi, pp. 177 ff., an explanation of Cæsar's tactics in the light of modern military science.

Latin and English.—This topic continues to figure largely in the publications of American classicists. H. A. Watt writes of "The Classical Invasion of English Literature" in *C.W.* xxi, pp. 121 ff.; C. Knapp, of "Literature in Early Rome and Literature in Early America" (*ibid.* pp. 137 ff.); C. Gohdes, of "Henry Thoreau, Bachelor of Arts" in *C.J.* xxiii, pp. 323 ff.; C. N. Smiley, in *C.J.* xxiv, pp. 45 ff., of "Latin and English," a timely plea for the precise and accurate use of words; E. D. Cressman, in *C.J.* xxiv, pp. 98 ff., of "The Classical Poems of Tennyson"; and R. C. Whitford, in *P.Q.* vii, pp. 9 ff., of "Juvenal in England, 1750-1802," finding the Roman satirist's influence widespread because of a favorable environment.

The Roman Writers.—Those writers whose popularity is shown by their appeal to the readers of *L.C.L.*, with a few exceptions where one might suspect the presence of a non-scholarly attraction, are also the subject of the greater number of papers. A special interest attaches just now to Vergil, because of the approaching bimillenial anniversary of the poet's birth. *C.J.* in the opening number of vol. xxvi prints an appeal for more study of Vergil and for the enrollment of as many pupils as possible in the Vergil classes of the year 1930-31; the number of the Journal for October 1930 is to be commemorative of the great Latin poet. Under this head H. P. Prescott has contributed a valuable study of *The Development of Vergil's Art* (Univ. of Chicago Press, 1927); H. Loane, "The *Sortes Vergilianæ*" in *C.W.* xxi, pp. 185 ff.; F. J. Miller, "Vergil's Motivation of the Æneid" in *C.J.* xxiv, pp. 29 ff.; and C. Saunders, "The Volscians in Vergil's Æneid" in *T.A.P.A.* lviii, pp. 92 ff. T. Frank has iven us in *Catullus and Horace: Two Poets in their Environment* a combination of sound scholarship with imagination and vividness of presentation. Horace is called "The Most Modern Voice from Antiquity" by C. C. Mierow in *C.J.* xxiii, pp. 348 ff., and G. H. Hallam, in *C.R.* xlii, pp. 125 ff. maintains that the poet had a villa at Tibur and that it is represented by the remains under the monastery of S. Antonio, opposite the great cascade; certainly it would have been difficult to find a more beautiful site.

R. C. Flickinger discusses "The Originality of Terence" in *P.Q.* vii, pp. 97 ff., and C. J. Kraemer writes "In Defense of Chærea in the Eunuch of Terence" in *C.J.* xxiii, pp. 662 ff., both articles being inspired by Gilbert Norwood's *Art of Terence*. W. A. Oldfather gives us an admirable sketch of Cicero in *C.J.* xxiii, pp. 404 ff., W. B. McDaniel, 2d, writes entertainingly of "Cicero and his House on the Palatine" (*ibid.*, pp. 651 ff.), and *T.A.P.A.* lviii, pp. 32 ff., M. Henry discusses "Circero's Treatment of the Free Will Problem." Other papers under this general head are: G. L. Hendrickson on "The First Satire of Persius" in *C.P.* xxiii, pp. 97 ff.; A. R. Bellinger on "Martial the Suburbanite" in *C.J.* xxiii, pp. 425 ff., H. C. Nutting on three passages of Juvenal in *A.J.P.* xlix, pp. 57 ff., where he suggests two attractive emendations and gives another argument in favor of crediting Juvenal with the possession of humor; A. B. West on "Lucilian Genealogy" (*ibid.* pp. 240 ff.), and R. S. Radford on "Ovid's *Carmina Furtiva*" (*P.Q.* vii, pp. 45 ff.), a discussion of the date of Ovid's earliest works, among which Radford includes *Ciris*, *Ætna* and *Copa*.

Roman Religion.—In *C.J.* xxiii, pp. 573 ff. H. M. Poteat writes of "Some Ancient Manifestations of the Religious Instinct"; J. Bridge in *C.J.* xxiii, pp. 610 ff., of "*Janus, Custos*

Belli"; E. W. Burriss, of "Survivals of Magic in Roman Religion" in *C.J.* xxiv, pp. 112 ff. The article of K. Scott on "The Deification of Demetrius Poliorcetes" in *A.J.P.* xlix, pp. 137 ff. is also of interest to the Latinist.

Palæography and Epigraphy.—B. L. Ullman in *P.Q.* vii, pp. 6 ff. notes additions to "Latin Manuscripts in America n Libraries," and in *C.P.* xxiii, pp. 250 ff. writes of "Tibullus in the Medieval *Florilegia*." E. A. Loew in *C.Q.* xxii, pp. 43 ff. contributes "More Facts about our Oldest Latin Manuscripts"; A. Jones in *T.A.P.A.* lviii, pp. 63 ff., "Notes on a Paris Manuscript of Petronius," and C. H. Beeson, in *C.P.* xxiii.l ff., "The Archetype of the Roman *Agrimensores*." In *C.W.* xxi, pp. 161, F. B. Krauss writes entertainingly of "The Human Element in Latin Inscriptions," and in *C.J.* xxiv, pp. 124 ff. A. W. Hodgman, of "A Latin Document of A.D. 1569," an account of the map of Gerhard Kramer, better known by his Latin name, Mercator.

Miscellaneous.—Under this head one of the most interesting papers is E. M. Sanford's *De Loquela Digitorum* in *C.J.* xxiii, pp. 588 ff., which gives information not only about counting on the fingers, but also of talking with them, of which we have an example as early as the days of Nævius in his well-known description of a coquette from the *Tarentilla*. Other papers under this head are: "A Journey through the Roman Empire," made in the new Museum of the Roman Empire, by A. B. Hawes (*C.J.* xxiii, pp. 594 ff.); on *Apophoreta*, or dinner-gifts, by S. L. Mohler (*ibid.* pp. 248 ff.); on "The Roman Law of Delphi and the *Lex Gabinia*" by M. Radin (*ibid.* 678 ff.); "An Italian Athens and a Roman Newport" by J. C. Altrochi (*ibid.* pp. 693 ff.); "The Legal Status of Clodius Albinus" by C. E. Van Sickle in *C.P.* xxiii, pp. 123 ff.; "The Kalendarium" by H. A. Sanders (*ibid.* pp. 255 ff.); "Roman Commerce in the Early Empire" by E. W. Bowen in *C.W.* xxi, pp. 201 ff.; "Greek and Roman Weatherlore of Sun and Moon" by E. S. McCartney (*id.* xxii, pp. 25 ff.), and "Tiberius and the Development of the Early Empire" by F. B. Marsh in *C.J.* xxiv, pp. 14 ff.

Bibliography.—The second part of Marouzeau's valuable *Dix Années de Bibliographie Classique* (see A.Y.B., 1827) has now appeared with an excellent Index of Authors, covering both volumes (Paris, 1928), and under the caption *Matières et Disciplines* gives lists of books and articles dealing with the various branches of Classical Philology, History, Linguistics, Palæography, etc., each conveniently subdivided. It is considerably larger than the first volume, containing 774 closely printed pages.

Translations.—To the *L.C.L.* have been added J. H. Mezley's complete works of Statius; the first volume of Seneca's *Moral Essays*, by J. W. Basore; Cicero's *De Re Publica* and *De Legibus*, by C. Keyes; and the third and last volume of the *Attic Nights* of Gellius. The forty-seven Latin volumes published so far seem to differ greatly in their popular appeal. *Catallus, Tibullus and the Pervigilium Veneris* (a single volume) has reached an eighth impression; the *Odes of Horace*, a seventh; the first volume of *Vergil*, a sixth; *Petronius* and *Seneca's Apocolocyntosis* (in one volume) and *Terence*, a fifth; *Apuleius, Cæsar's Gallic War, Juvenal and Persius*, and the first volumes of *Cicero's Letters to Atticus, Ovid's Metamorphoses* and *Suetonius*, a fourth.

Note: The preceding abbreviations are used: *A.Y.B., American Year Book; D.G.R., Our Debt to Greece and Rome; A.J.P., American Journal of Philology; C. J., Classical Journal; C.P., Classical Philology; C.Q., Classical Quarterly; C.R., Classical Review; C.W., Classical Weekly; L.C.L., Loeb Classical Library; P.Q., Philological Quarterly; T.A.P.A., Transactions of the American Philological Association; U.C., University of California Publications in Classical Philology.*

GREEK LITERATURE

By Robert Chisholm Horn

Professor, Muhlenberg College

Handbooks.—In the series entitled *Our Debt to Greece and Rome*, now published by Longmans, Green and Co., appeared in 1927 *Lucian*, by F. G. Allinson; and in 1928 *Greek Rhetoric and Literary Criticism*, by W. Rhys Roberts, and *Psychology, Ancient and Modern*, by J. G. Brett. We welcome particularly several books which tell of our cultural inheritance from Greece; such are: *Hellas the Forerunner*, two volumes, by H. W. Household (Dutton, 1927 and 1928); *Our Hellenic Heritage*, by H. R. James (Macmillan, 1927); and *The Story of Greece and Rome*, Their Growth and Their Legacy to Our Western World, by J. C. and H. G. Robertson (London, Dent, 1928). We should mention here also *Greece, Old and New*, by Ashley Brown (Dodd, Mead and Co., 1927) and the very readable and attractively illustrated book entitled *Glimpses of Greece*, edited by J. P. Salmon, published in 1928 by the Hellenic Information Bureau at Washington, D. C. Works dealing with ancient civilization are: *The Story of Extinct Civilizations of the East and West*, by R. E. Anderson (Appleton Dollar Library, 1927), and *Ancient Civilizations*, From the Earliest Times to the Birth of Christ, by D. A. Mackenzie (Blackie, 1927).

The Loeb Classical Library in the latter part of 1927 added to its collection *Athenæus, the Deipnosophists*, by C. B. Gulick; *Lyra Græca*, Vol. III, by J. M. Edmonds; *Isaeus*, by E. S. Forster; *Dio Cassius*, Vol. IX, by E. W. Cary; *Josephus*, Vol. II, by H. St. J. Thackeray; and *Plato, Charmides, etc.*, by W. R. M. Lamb. *Athenæus* is to be published in six volumes, of which this is the first. In the present year the following books appeared: *Josephus*, Vol. III, by H. St. J. Thackeray; and *Strabo, Geography*, Vol. V, by H. L. Jones; and *Isocrates*, Vol. I, by G. Norlin.

Art and Archæology.—We now have an English translation of the *Acropolis of Athens*, by Martin Schede; the translation is by H. T. Price (Botsford, 1927). A work of importance is *Lysippos*, by F. P. Johnson (Duke University Press, Durham, N. C., 1927). Americans will be interested in *Essays in Ægean Archæology*, ed. S. Casson (Oxford Univ. Press, 1927), and *The Glamour of Near East Excavation*, by James Baikie (Seeley, Service, 1927). The former is a presentation to Sir Arthur Evans in honor of his seventy-fifth birthday. *Art in Greece*, by A. de Ridder and W. Deonna, is one of the volumes in the series entitled *History of Civilization* (Knopf, 1927).

Texts and Commentaries.—An important recent work of American scholarship is *Theophrastus, De Causis Plantarum*, Book I, by Robert E. Dengler, of State College, Pa. The work contains Text, Critical Apparatus, Translation, and Commentary, and is published by the author. A publication of great value is *The Fragments of the Lyrical Poems of Alcæus*, by Edgar Lobel (Oxford Univ. Press, 1927). A contribution to the interpreation of Plato is made by A. E. Taylor's *Commentary on Plato's Timæus* (Oxford Univ. Press, 1928).

Translations.—Among translations of Greek authors are the following: *The Odes of Anacreon*, by Erastus Richardson (Yale Univ. Press, 1928); *Æschylus, The Persians*, by C. B. Armstrong (Allen and Unwin, 1928); *The Phædo of Plato*, by the Hon. Patrick Duncan, in the Oxford Library of Translations (Oxford Univ. Press, 1928); and Volume VIII of the *Works of Aristotle*, the *Metaphysica*, second edition (Oxford Univ. Press, 1928). Among the Broadway Translations of recent date is *Sappho, The Poems and Fragments*, Greek text with an English translation, by C. R. Haines (Dutton).

Greek Language.—One of the most important books for the student of Greek is the new edition of the *Introduction to the Study of the Greek Dialects*, by C. D. Buck (Ginn and Co., 1928). Not only is the subject brought up to date but the appearance of the volume is made very attractive. Part Three of the new edition of the *Greek-English Lexicon* of Liddell and Scott has been published by the Oxford University Press, American Branch. A new and cheaper edition of the *English-Greek Dictionary* of S. C. Woodhouse has been published by E. P. Dutton. *A Manual Grammar of the Greek New Testament*, by H. E. Dana and J. R. Mantey, appeared last year (Macmillan). A most satisfactory book for beginners in Greek is *An Introductoin to Greek*, by H. L. Crosby and J. N. Schaeffer (Allyn and Bacon, 1928). This book is beautifully illustrated, contains much cultural material, and is a most attractive Beginner's Greek Book.

Homer.—The question of the home of Odysseus is constantly with us; several contributions to the solution of this question have appeared recently. Dr. Doerpfeld's *Alt-Ithaka*, in two volumes, stimulated interest anew. In the past year appeared the interesting little book of Sir James Rennell Rodd, *Homer's Ithaca, A Vindication of Tradition* (Longmans). Another claim for Thiaki as the Ithaca of Homer is made by Champlin Burrage in *The Ithaca of the Odyssey* (Oxford, Blackwell, 1928). In 1927 the Winston Company, of Philadelphia, published *The Odyssey of Homer*, translated into English prose, by Robert H. Hiller; the translation is in present day idiomatic prose and will prove interesting to many older readers as well as the young, for whom it is intended.

Greek Literature.—In this department there are several delightful books: *The Classical Tradition in Poetry*, by Gilbert Murray (Harvard Univ. Press, 1927); *The Classics and Our Twentieth Century Poets*, by H. R. Fairclough (Stanford Univ. Press, 1927); and *Epochs of Greek and Roman Biography*, by D. R. Stuart (Univ. of California Press, 1928). The last is the fourth volume of the Sather Classical Lectures; the earlier volumes in the series are: *The Unity of Homer*, by J. A. Scott; *Æschylean Tragedy*, by H. W. Smyth; and *Herodotus*, by T. R. Glover. Gilbert Murray's *History of Ancient Greek Literature* was published in 1927 in the Appleton Dollar Library. In this place may be mentioned also *Many Minds*, by Maurice Hutton (London, Hodder and Stoughton, 1927) and *Irony, An Historical Introduction*, by J. A. K. Thomson (Harvard Univ. Press, 1927).

Greek History.—A scholarly contribution to our knowledge of Greek history is *Ancient Sicyon*, by C. H. Skalet (The Johns Hopkins Press, 1928). *Macedonian Imperialism*, by Pierre Jouguet, is in the series *History of Civilization* (Knopf, 1928). Two books by Edwyn Bevan should be mentioned here: *A History of Egypt under the Ptolemaic Dynasty* (Methuen, 1927), and a brief survey, *The World of Greece and Rome* (Benn, 1927). Other works are: *History of Sciences in Greco-Roman Antiquity*, by A. Reymond (Dutton, 1927), and *Democracy in the Ancient World*, by T. R. Glover (Macmillan, 1927).

Greek Life and Culture.—*Money and Monetary Policy in Early Times*, by A. R. Burns, is part of the *History of Civilization* (Knopf, 1927). Works on Greek thought are: *Greek Philosophy before Plato*, by Robert Scoon (Princeton Univ. Press, 1928), and *Greek Thought in the New Testament*, by G. H. Gilbert (Macmillan, 1928). Works on Greek religion are: *Later Greek Religion*, by E. R. Bevan, one of the volumes in the *Library of Greek Thought* (Dutton, 1927), and *The Minoan-Mycenæan Religion and Its Survival in Greek Religion*, by M. P. Nilsson (Oxford Univ. Press, 1927). Two valuable bibliographies are: *A Working Bibliography of Greek Law*, by G. M. Calhoun and Catherine Delamere (Harvard Univ. Press, 1927), and *A Bibliography of the Poetics of Aristotle*, by Lane Cooper and Alfred Gudeman (Yale Univ. Press, 1928). A valuable piece of scholarly work, which appeared in

1926, is *Nicomachus of Gerasa, Introduction to Arithmetic*, translated into English by M. L. D'Ooge, with *Studies in Greek Arithmetic* by F. E. Robbins and L. C. Karpinski (The Macmillan Co.). Two useful articles, contributing not a little to our knowledge of life in ancient times, are: "In the Service of Rome, Letters from the Michigan Collection of Papyri" (*C.P.*, vol. 22, pp. 237 ff.) and "The Family Letters of Paniskos" (*Journ. Egypt. Archæol.*, vol. 13, pp. 59 ff.). Two other interesting articles are: "A Weaver of Oxyrhynchus," by Ethel H. Brewster, and "The Nomarch Nicanor," by C. J. Kraemer, Jr.; both of these are to be found in *T.A.P.A.*, vol. 48. In this connection, where mention is made of work in Papyrology, attention may well be called to the *British Museum Catalog of the Literary Papyri*, ed. by H. J. M. Milne (Oxford Univ. Press, 1928).

General.—A little book of great value for many persons, appearing now in its third edition, is *The Claim of Antiquity*, with an Annotated List of Books for those who know neither Latin nor Greek (Oxford Univ. Press, 1927). Another book of evident worth is *The Handbook of the Classical Collection*, by Gisela M. Richter (New York, Metropolitan Museum of Art, 1927). For some years it has been almost impossible to obtain a copy of *Latin and Greek in American Education*, by F. W. Kelsey; a new edition of this invaluable work was published this year by Macmillan. This edition, like the first, deserves and will receive a most hearty welcome.

SEMITIC LANGUAGES AND LITERATURE

By George A. Barton

Professor, University of Pennsylvania

Book of Isaiah.—The most noteworthy publication in this field during 1928 by an American scholar is doubtless Professor Charles C. Torrey's *The Second Isaiah*, a work comparable to Koppe's commentary of 1781 and Duhm's *Jesaia* of 1892, Koppe was the first to suggest that chapters 40-66 of the Book of Isaiah were written by a different prophet than chapters 1-39. In time this was accepted, and the Second Isaiah, as he came to be called, was believed to have lived and written in Babylonia between 550 and 530 B.C. Duhm attributed the major part of chapters 56-66 to a Third Isaiah, who lived in Palestine between 500 and 444 B. C. Torrey now shows by convincing arguments that chapters 40-66 are the work of one man; that chapters 34 and 35 are the work of the same poet and originally formed the introduction to his work; that the later additions and interpolations are almost negligible; that the Hebrew text is remarkably well preserved, and that the Second Isaiah lived in Palestine shortly before the year 400 B. C.

Fifteenth Century *Who's Who*.—Another noteworthy publication is *As-Suyutt's Who's Who in the Fifteenth Century*, edited by Dr. Philip K. Hitti of Princeton University. This is a biographical dictionary of notable men and women in Egypt, Syria, and the Moslem world of five hundred years ago. The text is in Arabic, Professor Hitti's native tongue.

Yale Oriental Series.—A valuable addition has been made to the Yale Oriental Series by the appearance of Professor Ferris J. Stephens' *Personal Names from Cuneiform Inscriptions of Cappadocia*. By this publication Dr. Stevens places within the reach of scholars valuable ethnological material from a region to which recent discoveries have attracted much attention.

Ur Excavations.—An even more noteworthy work in the same field is *Ur Excavations—Texts*—I, *Royal Inscriptions*, edited by C. J. Gadd and L. Legrain. Since the expedition that has excavated Ur is financed largely

by the University Museum, the work may fairly be claimed as an American product. It is an attractive publication in quarto and contains over three hundred inscriptions. Many of them are fragmentary. The copies are well and accurately made.

Arabia.—Of quite a different sort is *Adventures in Arabia* by W. B. Seabrook. Having made the acquaintance in New York of the son of an influential Druse of Beirut, Mr. and Mrs. Seabrook went to the East, and Mr. Seabrook traveled with an Arabian tribe in North Arabia after the manner of Doughty, enjoyed the hospitality of Druses in Jebel-ed-Druz, and also of the Dervishes of Syria. He visited the Yezidis, or Devil worshipers in northern Mesopotamia. The story of these adventures is told in an easy journalistic style. The narrative is valuable for its report of national and religious customs and ceremonies and for its shrewd insight.

Egyptian Grammar and Hittite Manual.—A scholarly work of quite a different type is Professor S. A. B. Mercer's *Egyptian Grammer, Chrestomathy, and Glossary*—a book intended for beginners in Egyptian. It is prepared by an experienced teacher, scholarly and accurate, and is well adapted to its purpose. Of a similar nature, though in another field, is Professor G. A. Barton's *Hittite Manual for Beginners*, a book which attempts for the first time to present a sign-list, grammar and vocabulary, as well as reading lessons in the written material of the recently deciphered cuneiform Hittite inscriptions. Though published in London and Paris, these books are to be credited to American scholarship.

Semitic Archæology.—To the field of Semitic archæology belongs Vol. VIII of the *Annual* of the American Schools of Oriental Research. It contains a long article by Professor E. A. Speiser of the University of Pennsylvania, on a topographical study made by him in northeastern Iraq and its bearing on the interpretation of a part of the anals of Ashurnasirpal; the description of some Babylonian antiquities by Professor Dougherty; an account of the work of the American Palestine Society of fifty years ago by President Moulton, and a discussion of the so-called Sumero-Indian seals by Professor Barton. During the year a new and revised edition of Professor Barton's *Religion of Israel* has also been issued.

Oriental Research.—The periodicals devoted to Semitic studies—the *Journal of the American Oriental Society*, the *American Journal of Semitic Languages*, the *Jewish Quarterly Review*, the *Journal of the Society of Oriental Research*, and the *Journal of Biblical Literature* have maintained a high level and have published noteworthy articles by American scholars. Mention should be made of the account of the remarkable discoveries of prehistoric royal tombs at Ur, written by Dr. Legrain in the *Museum Journal;* of the work of the Harvard-Baghdad School expedition led by Professor Chiera at Yargon Tepa near Kirkuk, of Professor Waterman at Tell Omar, of Dr. Albright and President Kyle at Tell Beit Mirsim, and of Professor Grant at Ain Shems—all published in successive numbers of the *Bulletin* of the American Schools of Oriental Research. Professor W. F. Badé's *Excavation at Tellen Nasbeh* (in pamphlet form) appears as the first publication of the Palestine Institute recently organized at Berkeley, California.

All this is but a preliminary account of creditable archæological work done in the past year by Americans. Among important articles are Professor Margolis' "Textual Criticism of the Greek Old Testament" in the *Proceedings of the American Philosophical Society*; Professor Barton's "Historical Results of Recent Exploration in Palestine and Iraq" in the *American Historical Review;* and Professor Butin's "Serabit Inscriptions" in the *Harvard Theological Review.*

LIBRARIES

By Dorothy Rowden

American Library Association

The Goal and Progress.—To decrease the number of people without adequate library service from millions to thousands and to hundreds, and gradually to provide books for everyone everywhere in the United States and Canada is the goal of the American Library Association. Although the numerous library buildings constructed in 1928 and the sixteen new county libraries which were established during the year seem to set us forward but a little toward the goal, they indicate that progress is surely being made.

COUNTY LIBRARIES

Taking Books to the People.—The establishment of sixteen county libraries should especially be noted. The majority of the people in the United States without library service live in the rural districts. Obviously a library system which has been proved successful in the cities, where the people can easily come to the library for books and information, is not feasible. The advantage of the county library system for rural districts is that it takes the books to the people. From a central collection of books in the county seat, books are distributed by mail and truck to branches of the main library, conveniently located in community centers, in schools, stores, churches, and homes where the people of the county can easily obtain them. The new county libraries established in 1928 are in the states of Indiana, Kentucky, Louisiana, Michigan, Minnesota, New York, North Carolina, Tennessee, Texas, Wisconsin, Oregon, and Maryland.

ADULT EDUCATION

Work of City Libraries.—The work many of the larger city libraries are doing to encourage adult education is new and interesting. Many of these libraries have established adult education departments, in which there is a "reader's adviser" whose duty it is to talk with individual readers about their reading problems, discover their wants and needs, and compile lists of books specifically for them. There are now reader's advisers or adult education departments in libraries in twenty-five cities in the United States.

Reading Courses.—An effort is being made to open new fields of knowledge to those of little formal education. To aid both the large library and the smaller library which cannot afford to add an extra person to its staff for adult education work, the American Library Association has been publishing for over three years a series of reading courses, "Reading with a Purpose" each one on a different subject and written by an authority. Each course consists of a short essay giving a comprehensive view of the subject, followed by a list of four or five books which are recommended to the reader in case he wishes to read further. "Reading with a Purpose" courses published in 1928 were: *Pivotal Figures of Science,* by Arthur E. Bostwick; *Adventures in Flower Gardening,* by Sydney B. Mitchell; *Good English,* by Virginia C. Bacon; *French Literature,* by Irving Babbitt; *Prehistoric Man,* by George Grant MacCurdy; *The Young Child,* by Bird T. Baldwin; and *Geography,* by J. Russell Smith.

LIBRARY SCHOOLS

Scope and Attendance.—Nearly 1,000 students attended library schools during the year 1927-28. There are now fifteen library schools accredited by the Board of Education for Librarianship of the American Library Association, which offer opportunities for graduate and undergraduate study. In addition to the schools accredited by the A. L. A., there are at least six or eight schools, some of them recently opened, sev-

eral of which are offering a full year's curriculum in library science for school library work. Every summer many of the accredited schools and a number of universities are offering summer courses in library science. Extension courses in residence in library science are available and now being offered by a number of schools.

University of Chicago.—A notable event in the history of library schools was the opening of the library school at the University of Chicago in the fall of 1928. It is the first school to be devoted exclusively to graduate work in library science.

Paris School.—In addition to the schools in the United States and Canada, there is an American library school in Paris, which is under the supervision of the American Library Association, of which Sarah C. N. Bogle, assistant secretary of the A. L. A., is director.

Correspondence School. — One change in location was made during the year. The American Correspondence School of Librarianship, formerly at Syracuse, N. Y., has been transferred to Columbia University to be administered jointly by the School of Library Service and the Home Study Department of the University.

BIBLIOGRAPHY WORK

Union List of Serials.—Printed copies of the *Union list of serials in the libraries of the United States and Canada* were distributed early in the year. This work, one of the most notable bibliographies ever sponsored by American libraries, includes an entry for over 75,000 titles of serials and locates holdings in over 225 American libraries. It involved nearly six years of labor and was edited under the care of a committee of the American Library Association. To test the wearing quality of various types of paper, sixteen test volumes of the *List* were printed, some on rag stock, others on sulphite stock. These were sent to libraries in various parts of the country where they will be used for a given length of time and then returned for an examination of the paper.

READING SCOPE

Study of Reading Habits.—A study of reading habits to discover what it is in the experience of some persons which causes them to acquire and continue desirable habits of reading, and what is lacking from the experience of others which leaves them without such habits, has been carried on during the past year by a committee appointed by the American Association for Adult Education and the American Library Association. The results of the preliminary investigation are being published by the Macmillan Company under the title of *The Reading Habits and Interests of Adults.*

Circulation Figures. — Circulation figures for the year were not available at the time this article was prepared, but a survey of the figures of some of the larger libraries shows a steady increase in circulation. Chicago, for example, reports an increase of nearly 900,000 circulation for the first nine months of 1928, over the corresponding months in 1927, and figures from the New York Public Library show an increase of 400,000 for the first six months of 1928 over the same months in 1927.

SCHOOL LIBRARIES

Standards.—Recognition on the part of school authorities of the value of the school library as an indispensable part of the school has become marked within the past few years. Institutes to discuss school library problems have been held for principals for the past two years at the National Education Association's annual meeting. New standards for southern high school libraries were adopted late in 1927 and must be complied with within three years by all of the schools on the accredited list of the Associaiton of Colleges and Secondary Schools of the Southern States. These standards advocate, "that books should be procured in proportion to the size of the enrollment, that adequate quarters and equipment should be provided, that librarians familiar with the purposes of the curriculum and trained in library technique should be employed,

and that appropriations for new acquisitions should be made a regular part of the school budget."

Miller Survey.—Using a score card for school libraries prepared by the Education Committee of the A. L. A. as a basis, E. L. Miller, assistant superintendent of schools in Detroit, made a survey of the high school libraries of the North Central Association of Colleges and Secondary Schools. The results of his survey given before the meeting of the Association showed so clearly the need for a further investigation of the subject that the Association voted to continue its study of the school library situation.

LEGISLATION

Book Postage.—New rates for book post became effective on July 1 under the Griest bill H. R. 12030, which was amended by the Senate Committee on Post Offices and Post Roads. The bill provides for a special rate on library books for local delivery, and in the first three zones or within the state.

CONFERENCES

American Library Association.—The fiftieth annual conference of the American Library Association, held at West Baden, Ind., during the week of May 28, was attended by over 1,200 of the 11,000 members of the Association. The John Newbery Medal, given annually by the Children's Librarians Section of the A. L. A. for the most distinguished children's book of the year, was awarded to Dhan Gopal Mukerji for his book, *Gay-Neck*. The presence of six Mexican delegates, appointed by the Secretary of Education of Mexico, was the occasion for a discussion of Mexican libraries. The usual meetings of college, school, reference, children's, and hospital librarians were held. There were round tables on adult education, library extension, religious books, small libraries, library work with the blind, and the foreign born.

Meeting with the Association were the American Association of Law Libraries, the American Library Institute and the Bibliographical Society of America. Officers elected for the year 1928-29 were: Linda A. Eastman, librarian, Public Library, Cleveland, O., president; Malcolm G. Wyer, librarian, Public Library, Denver, Col., first vice-president; Harriet A. Wood, state assistant director and supervisor school libraries, Library Division, Minnesota Department of Education, St. Paul, second vice-president; Matthew S. Dudgeon, librarian, Public Library, Milwaukee, Wis., treasurer; H. M. Lydenberg, chief reference librarian, Public Library, New York City, and Joseph L. Wheeler, librarian, Enoch Pratt Free Library, Baltimore, for members of the Executive Board, and George Woodruff, The National Bank of the Republic, Chicago, who is trustee of endowment fund.

Mexican Congress.—In April, delegates from the A. L. A. were sent to Mexico by the Carnegie Endowment for International Peace to attend the Second National Congress of Librarians in Mexico, and to extend to six Mexican librarians an invitation to attend the A. L. A. conference as the guests of the Carnegie Endowment for International Peace. The invitation was accepted and the following six delegates were appointed: Señorita Esperanza Velázquez Bringas, head of Library Department, Ministry of Education, Mexico City; Señor Joaquín Méndez Rivas, director, National Library of Mexico, Mexico City; Señor Rafael Heliodoro Valle, Library Department, Ministry of Education, Mexico City; Señor Joaquín Díaz Mercado, librarian, Library of the Ministry of Education, Mexico City; Señor Rafael Aguilar y Santillán, perpetual secretary, Sociedad Científica "Antonio Alzate," Mexico City; and Señor Tobías Chávez, director, University of Mexico Libraries, Mexico City.

The delegates, meeting with members of A. L. A. boards and committees especially interested in forwarding the mutual library interests of the United States and Mexico, passed resolutions looking to an exchange of library personnel, publications, exhibits, and bibliographical in-

formation; the sending of a collection of children's books to Mexico; the translation into Spanish of American works on library practice; membership in the A. L. A. of Mexican librarians and the publication by the Ministry of Education of Mexico of a monthly list of all government and private publications printed in Mexico. Both before and after the conference an opportunity was given the delegates to visit some of the outstanding libraries of the United States and to see American librarians at work.

RELATIONS ABROAD

Foreign Visitors.—Among the distinguished librarians from foreign countries to visit the United States for study, travel, and consultation with American librarians were: Dr. Tietse Pieter Sevensma, librarian of the League of Nations, and Dr. Pierre Roland-Marcel, librarian of the Bibliothèque Nationale.

American Visitors Abroad.—Librarians from the United States likewise visited foreign countries for professional reasons. W. W. Bishop, librarian of the University of Michigan Library; J. C. M. Hanson, of the University of Chicago Libraries, and Charles Martel, chief of the Cataloging Division of the Library of Congress, at the request of Vatican Library authorities and by means of a grant from the Carnegie Endowment for International Peace spent several months at that library, studying its catalog, making suggestions for its enlargement and revision and conferring about the Vatican collection of printed books and incunabula. Milton Ferguson, of the California State Library, and S. A. Pitt, of the Library at Glasgow, Scotland, have been sent to South Africa to make a survey of library conditions for the Carnegie Corporation of New York.

LIBRARY PROGRESS

Funds for Work.—A municipal loan of $3,000,000 for a new central building for the Enoch Pratt Free Library at Baltimore; a fund of $500,000 pledged by the trustees of Lehigh University for the building of an addition to the University Library; the gift of a cultural reading room, The A. F. Morrison Memorial Library, to the University of California; a gift of their residence by Mr. and Mrs. Samuel Rauh to be used as a branch of the Indianapolis Public Library; a gift of $50,000 from David A. Boody for the benefit of employees of the Brooklyn Public Library, are typical of the funds voted and given for libraries and library work all over the country. A grant of $25,000 was made through the A. L. A. Committee on Library Extension by the Carnegie Corporation for library relief in the districts suffering losses from the floods along the Mississippi Valley and in Vermont.

New Buildings.—Some of the library buildings either under construction or finished during the year are: the Montieth Regional Branch in Detroit, completed at a cost of over $230,000; the Knox College Library in Galesburg, Ill., completed at a cost of $200,000; the Electra C. Doren Branch of the Dayton (O.) Public Library; the Public Library of Bloomfield, N. J.; the Pullman Branch of the Public Library in Chicago, the Queens Borough Public Library in New York being constructed at a cost of over $1,000,000; the Sterling Memorial Library at Yale University; the California State Library; the Richland Parish Library, Louisiana (county library); the Warren Free Public Library, Warren, Me., completed at a cost of $20,000; the Cortland (N. Y.) Free Library; the Jones Library in Amherst, Mass., and the Hoyt Library in Kingston, Penn. Among the libraries which are making plans to begin work on new buildings are: the Enoch Pratt Free Library, Baltimore, Maryland; the Richmond, Virginia Public Library, and the Cincinnati, Ohio Public Library.

COGNATE SOCIETIES

GENERAL

AMERICAN ACADEMY OF ARTS AND LETTERS.—633 W. 155th St., New York, N. Y.

AMERICAN ACADEMY OF ARTS AND SCIENCES.—28 Newbury St., Boston, Mass.

AMERICAN BOOKSELLERS' ASSOCIATION.—15 Park Ave., New York, N. Y.

AMERICAN COUNCIL OF LEARNED SOCIETIES.—23 University Hall, Cambridge, Mass.

AMERICAN LIBRARY ASSOCIATION.—Randolph St., Chicago, Ill.

AMERICAN NEWSPAPER PUBLISHERS' ASSOCIATION.—270 Madison Ave., New York, N. Y.

AMERICAN PHILOSOPHICAL SOCIETY.—Independence Sq., Philadelphia, Pa.

AMERICAN SOCIETY OF COMPOSERS, AUTHORS AND PUBLISHERS.—56 W. 45th St., New York, N. Y.

AMERICAN SOCIETY OF NEWSPAPER EDITORS.—Washington, D. C.

ASSOCIATION OF NEWSPAPER ADVERTISING EXECUTIVES.—Indianapolis News Bldg., Indianapolis, Ind.

ASSOCIATED PRESS.—383 Madison Ave., New York, N. Y.

ASSOCIATION OF FOREIGN PRESS CORRESPONDENTS IN THE UNITED STATES.—66 Broadway, New York, N. Y.

ASSOCIATION OF NATIONAL ADVERTISERS.—17 W. 64th St., New York, N. Y.

BIBLIOGRAPHICAL SOCIETY OF AMERICA.—Grosvenor Library, Buffalo, N. Y.

GERMAN PRESS CLUB OF NEW YORK.—21 Frankfort St., New York, N. Y.

MODERN LANGUAGE ASSOCIATION OF AMERICA.—New York University, New York, N. Y.

NATIONAL ASSOCIATION OF BOOK PUBLISHERS.—45 W. 23rd St., New York, N. Y.

NATIONAL EDITORIAL ASSOCIATION.—131 E. 6th St., St. Paul, Minn.

NATIONAL INSTITUTE OF ARTS AND LETTERS.—633 W. 155th St., New York, N. Y.

NATIONAL PUBLISHERS' ASSOCIATION.—15 W. 37th St., New York, N. Y.

PEOPLES' INSTITUTE.—10 Fifth Ave., New York, N. Y.

UNITED PRESS ASSOCIATION.—63 Park Row, New York, N. Y.

UNITED STATES PUBLISHERS' ASSOCIATION, INC.—522 Fifth Ave., New York, N. Y.

AMERICAN LITERATURE

AUTHORS' LEAGUE OF AMERICA.—420 Lexington Ave., New York, N. Y.

AMERICAN DIALECT SOCIETY.—Warren House, Cambridge, Mass.

AUTHORS' GUILD.—2 E. 23rd St., New York, N. Y.

AUTHORS' LEAGUE OF AMERICA, INC.—2 E. 23rd St., New York, N. Y.

CATHOLIC WRITERS' GUILD OF AMERICA.—128 W. 71st St., New York, N. Y.

NATIONAL ASSOCIATION FOR AMERICAN SPEECH.—2480 Broadway, New York, N. Y.

NATIONAL COMMITTEE TO STUDY JUVENILE READINGS.—1 Madison Ave., New York, N. Y.

SIMPLIFIED SPELLING BOARD.—Lake Placid Club, Essex County, New York.

LANGUAGE AND LITERATURE

AMERICAN PHILOLOGICAL ASSOCIATION.—Trinity College, Hartford, Conn.

AMERICAN CLASSICAL LEAGUE.—First National Bank Building, Princeton, N. J.

AMERICAN ORIENTAL SOCIETY.—Yale University, New Haven, Conn.

AMERICAN PHILOLOGICAL ASSOCIATION.—Adelbert College, Cleveland, O.

DANTE LEAGUE OF AMERICA, INC.—15 Gramercy Park, New York, N. Y.

DICKENS FELLOWSHIP OF NEW YORK.—119 E. 19th St., New York, N. Y.

INTERNATIONAL DANTE SOCIETY.—15 W. 107th St., New York, N. Y.

MODERN LANGUAGE ASSOCIATION OF AMERICA.—Bryn Mawr College, Bryn Mawr, Pa.

DIVISION XXVI

THE ARTS

ARCHÆOLOGICAL DISCOVERY

By Ralph Van Deman Magoffin

President, Archæological Institute of America

MESOPOTAMIA

Kish.—The Joint Expedition to Mesopotamia of the Field Museum of Chicago and Oxford University, England, under Director Stephen Langdon has done the most important piece of work during the year. The lowest stratum of the temple mound has brought to light the ruins of the largest temple thus far uncovered. Not only do the ruins disclose artifactual history of the oldest Sumerian kingdom, but the pottery, the gold work, and the tomb objects are of a date prior to 3500 B.C., thus antedating both Ur of the Chaldees and the First Egyptian dynasty.

Ur of the Chaldees.—The most sensational finds of the year are the two royal tombs of Mes-Kalam-dug and Queen Shub-Ad. This is the dig of the Joint Expedition of the British Museum and the Museum of the University of Pennsylvania under Director C. Leonard Woolley. Ancient human sacrifice is proved in the double tomb, one of which is that of Queen Shub-Ad. The other, that of the king, was empty, having been despoiled in antiquity. In the sacrificial tomb, the guardian soldiers and fifty other attendants had been sacrificed while, or as if, standing in their regular places as courtiers. The robbers had overlooked a bull's head of solid gold with beard and hair of lapis lazuli which is one of the finest pieces of ancient artistic work ever found. The mosaic inlay of shell, pink limestone, and lapis gives pictures of early Sumerian life that are "unparalleled in art, invaluable for history." In the tomb of Mes-Kalam-dug was found his wig, or ceremonial head dress, of solid gold, a unique find of extraordinary value.

INDIA

Mohenjo-daro.—Sir John Marshall has uncovered a site covering thirteen acres, of which the three earliest cities are prehistoric. Its dates are 3300-2700 B.C. The culture is Chalcolithic and seems to be the same as that stretching from the Adriatic to Japan, with its greatest concentrations in the valleys of the rivers Nile, Euphrates, Tigris, Indus, and Hoang-ho.

Harappa.—The discovery in prehistoric sites of spindle whorls and pieces of finely woven cloth seem to establish the fact that the cotton plant of the genus *Gossypium* was known here as far back as 3000 B.C. The pottery has much in common with that of Mesopotamia.

PALESTINE

Mizpah.—W. F. Badé has continued his work at Tell-En-Nasbeh, seven miles north of Jerusalem, with much success. His discovery of the walls was due to aeroplane photographs made by German aviators during the war. These defense walls are 26 feet thick. In addition to finding this Israelitish sanctuary with its temple and High Place, Dr. Badé discovered a sealed cistern which seemed to be that into which Gedaliah and his murdered companions were thrown, as related in Jeremiah (Chapters 40 and 41).

Beth-Shan.—The Palestine Expedition of the Museum of the University of Pennsylvania under Field Director Rowe has continued its work at Beisan (Beth-Shan). Nine superimposed city levels have been worked through. These levels extend from the Bronze Age to the Byzantine era. During the year, two temples of the Egyptian Thothmes III have been laid bare. This will give more comparative data for the history of the times through which the Hittites and Egyptians fought across Palestine and Syria.

Jerusalem.—The Palestine Exploration Fund under J. W. Crowfoot has found at Ophel a necropolis which is probably that of the tombs of the Kings of Judah. Near the Pool of Siloam a Byzantine street, 16 feet wide, was discovered ten feet below the present surface. A number of houses were found bordering the street. Under one house beneath an arch was found a long lost gate in the western wall of the City of David.

EGYPT

Giza.—The tomb of Meresankh, great granddaughter of Queen Hetepheres I, discovered by Reisner of Harvard last year, has been exhumed. It turns out that it is a part of the Cheops family cemetery. Ten statues of women and their funerary equipment were found. The tomb had been plundered in antiquity of the gold and small valuables. Also during the past year, the sphinx has been completely exhumed.

Karnak.—Eight perfectly preserved Osiriac statues of Amenophis IV (Akhenaten) were found during the spring excavations.

Thebes.—The British Museum expedition completed its work on the sandstone burial crypt in the tomb of Queen Neferu. It is the best crypt thus far found of the XI Dynasty (*ca.* 2000 B.C.). An interesting find is that of the bodies of sixty soldiers who had been hastily buried. In their bodies were found the arrow heads and shafts with which they had been slain. The most beautiful lapidary work of the XVIII Dynasty (*ca.* 1500 B.C.) is seen in the find of 299 scarabs which were deposited as a dedicatory gift on the day the temple of Queen Hatshepsut was founded at Deir el Bahri.

GREECE

Corinth.—T. Leslie Shear of Princeton has continued his splendid work on the theater, clearing the stage, uncovering the east parodos, and laying bare "Theatre" street. In the last two weeks of the season thirty-three unrifled graves were opened. They were found north of the dump, and luckily before they were again covered deeper than ever. These graves belong to the same cemetery in which Hill and Dinsmoor excavated in 1915-1916. In them many vases, strigils, and lamps were found. The contents show that the graves should be dated in the last quarter of the sixth and the first quarter of the fifth centuries B.C. The Odeum has been excavated by Broneer, and additional information obtained about theater curtain channels. A fine statue was found of an Athena Archegetis holding an owl in her left hand. It is a good Roman copy of a sixth century B.C. Greek type. Fine marble heads of Zeus and Medusa were also discovered.

Olynthus.—The discovery and excavation of ancient Olynthus on the Chalcidian promontory by D. M. Robinson of Johns Hopkins was the outstanding work of the year in the Greek field. The citadel and the town were both laid bare. The city was destroyed by King Philip of Macedon in 348 B.C., so Prof. Robinson has given us a splendid example of a city of the period before Alexander the Great, thus filling a gap which historians have greatly deplored. A great many art treasures of different sorts were found during the excavation which was done for Johns Hopkins University and the Baltimore Museum of Art with money provided by generous citizens of Baltimore.

Nemea.—A semi-subterranean crypt found at the rear of the *cella* of the temple of Zeus is the only Holy of Holies thus far discovered on ancient Greek soil. Houses and a neolithic cave are shown by ceramic remains to date from early Hellenic through late Hellenic times (2000-1400 B.C.).

There was also found a part of a cranium which is the earliest piece of skeletal remains thus far found in the Peloponnesus.

Athens.—Professor Edward Capps of Princeton announced that the arrangements with Greece had been completed for the excavation of the ancient Agora. Work will begin in the spring of 1929 under the auspices of the American School, the eldest daughter of the Archæological Institute of America.

ITALY

Rome.—The amount of work during the year has been amazing. The Capitoline Hill has been liberated of most of its modern unsightly buildings and the new Museo Mussolini established. The clearance of the Circus Maximus has begun, a piece of work planned to extend over ten years. Bartoli's work on the excavation of the palace of Domitian on the Palatine has been surpassed only by the work of Paribeni in his accessions and arrangements in the National Museum.

Ostia.—Calza has cleared the huge baths. He also found the substructure of the ancient Via Ostiensis of the second century B.C., made of huge square piles of oak wood, above which the lava blocks were laid at a later reconstruction.

Spina.—The greatest find of Greek vases of different types thus far discovered came to light at Spina near Ravenna. Spina was a rich commercial Greek colony which exchanged its grain and cattle for manufactured goods, especially pottery. Over 500 tombs have been excavated thus far. An official publication is awaited with intense interest.

Nemi.—A powerful electric pump has been installed in the Lake of Nemi which is discharging the water of the lake through the ancient *emissarium*. The water should be low enough by 1929 to uncover the sunken imperial galleys.

Campania.—Maiuri may claim the credit for the most extensive archæological work of the year. At Caivano he found intact five marble tombs. Their contents of objects of gold and other metals give fourth century B.C. culture artifacts dating from the period before Campania had fallen to Rome. Maiuri will continue to excavate the necropolis, which thus far is seen to be both extensive and untouched. At Herculaneum, Maiuri has excavated fourteen more rooms and the garden area in the House of the Skeleton. Fine mosaic pavements and a number of statuettes have also been brought to the light of day.

ENGLAND AND FRANCE

Chester.—Much light has been thrown on the Roman life during the military occupation of Britain from the Flavian era to the fourth century A. D. by the excavation of a Roman fort in Deanery Field. The foundation walls, the floors and hearths, many coins, pottery, gaming counters, knives, fishhooks, and particularly crucibles for working lead, are among the finds.

Glozel.—There is no longer any doubt that the objects found at Glozel near Vichy are forgeries.

YUCATAN AND NEW MEXICO

Chichen Itza.—A most important piece of work is that on the splendid Temple of the Warrior by Morris and Morley of the Carnegie Institution of Washington. The finest piece of aboriginal American decorative ornament thus far found in the western hemisphere is the "Chichen Mosaic Placque" found by Earl Morris. In a jar was discovered a mosaic, nine inches in diameter, composed of over 3,500 carefully cut pieces of turquoise. The turquoise was certainly mined in New Mexico or Arizona, made into its patterned mosaic in the valley of Mexico, and then put as a dedicatory offering beneath the floor of the temple.

Mimbres Valley.—A pueblo excavation during the summer has given Wesley Bradfield, ceramic expert of the School of American Research at Santa Fe, a ceramic chronology that carries the culture of the Pueblo Indians in New Mexico back to a time before the Christian era.

PAINTING

By Frances M. Henderson
American Federation of Arts

Progress in the field of painting from year to year is not easily marked, for the reason that it is ever a gradual development, punctuated now and then—unfortunately only occasionally—by some brilliant achievement. In 1928, perhaps the most encouraging feature to be accounted in connection with the larger and more important exhibitions set forth was the number of new names listed in the catalogues, and the almost universal originality of the work which these names represented.

MUSEUMS AND GALLERIES

New Pennsylvania Museum.—The art of painting and other branches of the fine arts were given fresh impetus through the opening of several new museum buildings, and additions to museums, containing priceless art collections. Of first importance was the new Pennsylvania Museum, designed by Trumbauer, Borie and Zantzinger, which was formally opened to the public March 26. The inaugural exhibition included paintings from rich collections bequeathed by William P. Wilstach, William L. and George W. Elkins, and John Howard McFadden, with objects from the many other collections of the museum. The plan of this new museum is unique. On its main exhibition floor it will eventually show, through a series of authentic period rooms (all of which have not yet been installed) and galleries containing art objects of corresponding periods, the pageant of the history of art from the earliest time to the present, recreating, as it were, the atmosphere in which the art was produced, and of the life lived contemporaneously.

Among the galleries and rooms which have been installed and exquisitely furnished are the Italian Gallery with paintings of the 15th and 16th centuries by Fra Angelico, Botticelli, Crivelli, Correggio, Bellini, Veronese, etc.; a room devoted to the art of the Low Countries, from the 15th to 17th centuries, with paintings by Rembrandt, Rubens, Holbein, Vermeer, etc.; a gallery of French art of the 18th century comprising not only paintings by the leading French masters of that day—Chardin, Corot, Ingres, Manet, Cezanne, Picasso, Van Gogh, and Matisse,—but famous tapestries and furniture of the period; and, finally, a series of English and Early American Period rooms, in which are to be found notable examples of the work of the leading representatives of the early British school of portrait painting,—Romney, Gainsborough, Hogarth, Raeburn, Reynolds, etc., and of our own early school.

New Corcoran Gallery Wings.—On March 11 the new Clark and Corcoran wings of the Corcoran Gallery of Art in Washington were thrown open, the former comprising the art collections of the late Senator William A. Clark of Montana, principally paintings of the French school of the 18th century, also tapestries, rugs, furniture, etc.; the latter containing the Gallery's collection of European paintings, which is now shown as a whole, leaving the galleries of the original building for the rapidly increasing American collections. The Clark Wing was erected through funds provided for the purpose by the widow and daughters of Senator Clark. After the completion of the building, announcement was made of a further gift from these same donors of an endowment fund for the permanent maintenance of the Clark collections.

The Museum of Fine Arts, Boston, opened a new wing of Decorative Arts on Nov. 14, which provides in like manner to the Philadelphia Museum, an authentic history of the decorative arts in various countries through a given period of years. The wing contains fifty-four galleries and period

rooms, and the collections range in point of time from the Gothic period through the first quarter of the 19th century. On the main floor are shown European collections from the Gothic period through the 17th century; on the ground floor, European and American collections of the 18th and early 19th centuries; and on the court floor are found American exhibits of the 17th and 18th centuries.

The National Academy of Design elected to membership at its annual meeting the following painters: George Elmer Browne, John Costigan, Robert Nisbet, John Folinsbee, Ezra Winter, William Paxton and Eugene Higgins.

ART IN EDUCATION

Phillips Andover Academy.—Among the numerous smaller galleries which came into being during the year were several established in connection with schools and universities, a most excellent evidence of recognition of the rightful place of art in education. Phillips Academy at Andover, Mass. (founded in 1778), took the initial steps in the founding of a gallery of American paintings as a cultural influence in the lives of the students. This, it is thought, was the first preparatory school to make such a move. The collection now includes approximately sixty paintings and several works in sculpture by eminent American artists, and is to find permanent placement in the new Oliver Wendell Holmes Library.

Yale University.—A portion of the new Gallery of Fine Arts at Yale University was opened to the public in September. This is of modified Romanesque style, conforming to the medieval character of the Memorial Quadrangle and other recent buildings on the campus, and houses the Jarves collection of Italian primitives, as well as the University's sculpture collection.

Indiana Summer Art Colony.—The former home of the late Theodore C. Steele, a well-known Indiana painter, was converted into a summer art colony for artists, similar to the MacDowell Colony at Peterborough, N. H. The estate includes several hundred acres of forest land, on which the artist's widow plans to erect numerous small studio buildings for the use of artists and art students throughout the country.

EXHIBITIONS

Carnegie Institute. — American painters were again given opportunity to compete for public favor with the painters of other countries in the International Exhibition of the Carnegie Institute, Pittsburgh, set forth Oct. 18 to Dec. 10. The exhibition was, as in the past three years at least, conspicuously modern, at the same time that it included not a few works by painters of conservative trends. Two of the awards went to Americans. The third prize of $500 was carried off by Glenn O. Coleman of Long Beach, N. Y., for a painting of Greenwich Village; and Honorable Mention was awarded to Georgina Klitgaard of Bearsville, N. Y., for a painting of a Truck Garden. The other awards were: first prize of $1500 to André Derain of Paris for a still life painting,—dead birds, a hunter's bag, and a gun thrown across a table—purchased for the permanent collection of the Carnegie Institute; the second prize of $1,000 to Pedro Pruna of Spain, likewise for a painting of still life; First Honorable Mention and $300 to Dod Procter of England for a "Portrait of a Girl"; and the Allegheny County Garden Club prize of $300 to Henri Lebasque of France. Honorable Mention was also awarded Marie Laurencin of Paris for a "Composition." The jury making these awards was composed of Rockwell Kent and Ernest Lawson of this country, Colin Gill of England and Anto Carte of Belgium. In addition to the American section comprising 130 paintings, the exhibition comprised approximately 275 paintings representing artists of fourteen nations of Europe.

American Art at Corcoran Gallery. —Among the all-American exhibitions, the Biennial Exhibition of Contemporary American Oil Painting, shown at the Corcoran Gallery of Art, Washington, from Oct. 28 to Dec. 9, was extraordinarily interesting

and significant. This year for the first time almost equal representation was given to modernists and conservatives, and the result was generally conceded to be a representative assemblage of present day production in this field. Here, again, the findings of the jury were in favor of the works of progressives. Bernard Karfiol, with his figure painting entitled "Summer," was awarded the first William A. Clark Prize of $2,000 and the Corcoran Gold Medal; Eugene Speicher, with a painting of a "Girl in White Dress" won the second William A. Clark prize of $1,500 and Corcoran Silver Medal; Frederick C. Frieseke, for a painting entitled "Frences," was accorded the third William A. Clark prize and Corcoran Bronze Medal; and Henry Lee McFee with a landscape carried the fourth William A. Clark prize of $500 and Corcoran Honorable Mention. These prizes were awarded by the rather conservative jury composed of Charles W. Hawthorne, Karl Anderson, Ernest L. Blumenschein, Adolphe Borie and Aldro T. Hibbard. From this exhibition the Corcoran Gallery purchased for its permanent collection the first prize painting by Karfiol; a still life by McFee, and a nude and a landscape by Arthur B. Davies.

At Chicago Art Institute.—The annual exhibition of American paintings and sculpture at the Art Institute of Chicago, Oct. 25 to Dec. 16, was smaller in point of the number of exhibits shown than those of other years, but was in fact one of the most worth-while and thought-provoking collections of the past few years. This exhibition, of all other annual exhibitions, offers the largest number of cash prizes; in fact, it is in itself a testimonial to the enerosity of the art-loving citizens of Chicago, through whose munificence most of these prizes are awarded. No less than ten awards were made in connection with the exhibition this year, amounting in value to $7,100. Among the painters whose works were selected for these honors were: J. Theodore Johnson, Arthur B. Carles, Max Weber, Maurice Sterne, Karl Knaths, Adolphe Borie, William S. Schwartz, Karl Oberteuffer, Robert Lee Eskridge and John C. Johansen.

Memorial Exhibits.—A notable memorial exhibition of works by Edwin Austin Abbey was set forth at the American Academy of Arts and Letters, New York, in November to continue for five months. The Academy also set forth during the year a memorial exhibition of paintings by William M. Chase. The late Walter Sargent, Professor of Fine Arts at the University of Chicago, was likewise memorialized by an exhibition of sixty of his paintings which were shown at the University in December. All of the paintings were purchased during the period of the exhibition.

Singer Sales Exhibit.—William H. Singer, Jr., an American artist now residing in Norway, held an exhibition of his Norwegian landscapes at the Durand Ruel Gallereis, New York, in April, almost all of which found purchasers. Among the museums acquiring his works at that time were the Metropolitan Museum of Art and the Brooklyn Museum. Mr. Singer has given to the city of Hagerstown, Maryland, the former home of his wife, funds for the erection of a Museum of Fine Arts, also a group of paintings, sculpture and other works of art to form the nucleus of the museum's collection.

MURAL PAINTING

Denver.—In the field of mural painting there has been encouraging activity in Denver, Col., which sets an example to other cities throughout the country in the patronage of local artists. The leading mural painters there are John Thompson, Allen True and Albert Olson, all of whom have made notable contribution during the year to the public buildings and private residences of the city.

Montgomery, Alabama.—For the state capitol at Montgomery, Alabama, Roderick D. MacKenzie completed a series of mural paintings depicting events from Alabama history.

California.—A series of fourteen frescoes and a tempera organ screen were completed for the music hall of

Mills College, Oakland, California, by Ray Boynton. The themes are abstract, and the paintings suggest the two principal emotions produced by music,—joy and sorrow. Albert Herter completed six mural paintings depicting the early history of California for the Los Angeles Public Library.

Beloit College.—For the Logan Museum of Beloit College, John W. Norton of Chicago produced an interesting series of murals depicting the actual life and likeness of early man as nearly accurately as modern research can establish them.

Field Museum.—Seven large and unusual mural paintings showing various phases of life on the earth in prehistoric ages were also placed in the Field Museum of Natural History, Chicago. They are the work of Charles R. Knight, who embodied in his conceptions scientific information resulting from the researches of members of the Museum's staff and other scientists throughout the country. These murals are the first of a series of twenty-eight, which when completed will extend entirely around the walls of Ernest R. Graham Hall of Historic Geology, and are the gift to the Museum from Mr. Hall, a trustee.

Detroit.—Fred Dana Marsh completed a ceiling decoration constituting a "Zodiac of Sports" for the Detroit Country Club. The ceiling of the main club room was subdivided into twelve sections, in each of which the artist has painted a sign of the Zodiac, with an appropriate sporting scene.

A mural painting representing a panorama of St. Louis by Frank Nudenscher, a St. Louis artist, was completed for the Hamburg-American liner, *St. Louis*.

Other Murals.—For the Park Central Hotel, New York, a series of twenty mural paintings depicting the development of inns and hostelries was completed by William Clark Rice just prior to his death in February. A painting of "Christ Among the Doctors," the work of Sister Mary Stanisia of Chicago, was unveiled in St. Luke's Roman Catholic Cathedral, St. Paul, Minnesota, in July. A painting by F. Luis Mora—"Achievement Is the Summit After the Climb" was installed in the Boys' Club of Pittsfield, Massachusetts.

ART IN SPORTS

In connection with the Ninth Olympiad held in Amsterdam during the summer months, an international exhibition of paintings, sculpture and architecture depicting subjects pertaining to sports was set forth. Included in the American section of this notable showing were paintings by Childe Hassam, E. Irving Couse, Granville Smith, John C. Johansen, Hayley Lever, Jonas Lie, Charles Morris Young, Patrick O'Connor, Carl Rungius and Eugen Weisz.

MEDALS AND FELLOWSHIPS

Denver City Club.—Among the independent awards in fine arts, outside of the field of exhibitions, were several for distinguished achievement in painting. The Denver City Club's Medal for painting was awarded to John E. Thomson, for his decorations in public and private buildings throughout the city of Denver, notably those in the new Denver National Bank.

Architectural League.—The Medal of Honor for Decorative Painting offered by the Architectural League of New York went to Hildreth Meiere for her decorations in the Nebraska State Capitol at Lincoln.

The Lazarus Fellowship in Painting, offered by the American Academy in Rome as a memorial to Jacob H. Lazarus, was awarded to Donald M. Mattison, a student in the School of Fine Arts at Yale University.

SCULPTURE

By Ralph Flint

Art Critic, *Christian Science Monitor*

THE NATIONAL ACADEMIES

Output and Exhibits.—The sculptural record for 1928 again indicates steady application to plastic problems in the American studios, with the same well considered output of bronzes and marbles to be seen at the large group exhibitions and in the smaller galleries, and with here and there notable instances of advancing talent in this taxing, slow-maturing form of the fine arts. The two annual National Academies brought out the usual array of conventional pieces, the Spring session having a slightly larger and more distinguished representation than the Winter meeting.

Prize Awards.—Laura G. Fraser won the Saltus Prize at the earlier Academy with a portrait; Anna Coleman Ladd, Hilda Lascari, Moses W. Dykaar, Bryant Baker, Janet Scudder, Edmund Quinn, Paul Manship, Bessie Potter Vonnoh, Richard H. Recchia, Emil Fuchs, and H. A. MacNeil also contributed. At the November Academy, Gertrude K. Lathrop won the Helen Foster Barnett Prize, Attilio Piccirilli, the Elizabeth N. Watrous Gold Medal with his "Una Vergine," and Anna Hyatt Huntington, the Julia A. Shaw Memorial Prize with her "Fighting Bull." Also present with representative work were Brenda Putnam, Philip S. Sears, Augustus Lukeman, Harriet W. Frishmuth, Gleb W. Derujinsky (with two fine wood carvings), and Leo Lentelli (an A.N.A. elect).

GRAND CENTRAL GALLERIES

Prize-Jury Show.—The Grand Central Galleries (New York City) presented the first of their prize-jury shows for members, with a more proportionate showing of sculpture than is common at the large painter-sculptor conventions. Harriet Frishmuth's "Sweet Grapes" won the highest sculptural honors, with awards to Allan Clark and F. G. Roth. Among the many sculptors seen at this exhibition were Charles M. Russell (graphic interpreter of the Southwest with its riding and roping, whose work, paintings included, was also seen "in memoriam" at these galleries in a special exhibition), Chester Beach, Adolph Weinman, Mahonri Young, Victor Salvatore, Mario Korbel, Edward McCartan, John Gregory, Leo Friedlander, Daniel Chester French, Hunt Deiderich, Herbert Adams, Gutzon Borglum, Margaret French Cresson, Cyrus Dallin, James Earl Fraser, Albin Polasek, Brenda Putnam, Boris Lovet-Lorski, Frederick W. MacMonnies, Isidor Konti, and Malvina Hoffman; a very select gathering indeed. The last-named artist also showed at these galleries the results of her three years of intensive sculpturing in Africa, Yugoslavia, Italy, and France, a group of forty pieces, mainly portraits of various nationalities in mediums ranging from marble to colored cement.

Aids University Collection.—The Grand Central Art Galleries were instrumental in aiding the University of Illinois with the formation of its collection of American sculpture, sending two pieces by Adolph Weinman, a single figure by R. Tait McKenzie, and a "Head of Lincoln" by Herman A. MacNeil.

Boris Lovet-Lorski at these uniquely located galleries early in the year showed his work, indicating a decided gain in all departments of his art. His advance, since a previous exhibition at Reinhardt's, is little short of phenomenal. He handles his blocks of wood or marble with a fine, clear touch, and he rounds out his ideas in full-bodied forms. A large, boldly stylized head in black marble commanded considerable attention among the critics, and rightly so, being a decidedly distinguished piece of sculpture. In fact, the same praise may be accorded most of Mr. Lovet-Lorski's latest creations. Evelyn Beatrice

Longman also showed recent sculpture at these galleries, at the same time as the Lovet-Lorski exhibition.

Harriet Frishmuth.—Her individual show at the Grand Central Galleries showed this popular artist in garden mood, with sprightly figures for pools and bosquets in abundance. Her handsome "Huntress," with attendant hounds, is in all respects a fitting climax to her art, so well suited for adorning open spaces.

EXHIBITS AT OTHER GALLERIES

Zorach.—William Zorach's exhibition at the Kraushaar Galleries also proclaimed a tremendous increase in sculptural command. His work has grown with the years until it now approaches a state of clarity and conciseness that is highly commendable. His forms, whether they be in the round or in the low-relief that is becoming so popular these days, are invariably subservient to the sculptor's individual sense of swelling, orotund planes, although this ovalescent tendency is apt to give his forms undue weight. But Mr. Zorach has admirably escaped this pitfall in most instances by the vitality of his silhouettes, and by the handsome tooling of his surfaces. Two carved wood panels, somewhat in the style of Mestrovic, show the artist in mounting command of this difficult medium. One of the healthy signs displayed by the modern sculptural fraternity is the willingness to attack plastic problems with the cut direct, digging down into the wood or stone for the imbedded form rather than building up their designs in the preliminary plaster.

Robert Laurent is another brilliant worker in wood and stone and his exhibition at the Valentine Gallery further intrenched him among the leaders of his profession. Already known as a master in handling the lovely alabaster and the richly colored woods of his particular choice, he added bronze to his program and with signal success. Two large alabaster pieces, of really unusual size, he has reduced to closely contained forms very reminiscent of the ancient Chinese sculptures but at the same time escaping any sense of being derivative or self-consciously archaic. He continues to develop his talents in this direction to still finer outcome, as one of his little alabaster torsos so eloquently bore witness.

Mahonri Young.—His individual show at the Rehn Galleries was perhaps the most outstanding individual contribution to the season's sculptural fare by an American. Returning to New York after a considerable period in France, this well-known sculptor presented a group of bronzes that showed him mounted several rungs higher on the ladder of achievement. Mr. Young has been these many years an able practitioner of the art, turning his clever hand not only to sculpture but to drawing and painting as well, but never before had he ever turned out anything to compare with the new bronzes, which for the most part sympathetically interpret provincial France.

The other part of the show, in a more familiar vein, dealt with the sporting world; but whether revealing the artist's keen interest in life as found in the peaceful round of the French peasant or in the livelier atmosphere of the boxing ring, these small bronze figures irradiate the artist's delight in living forms. They are of a rare degree of beauty, in their form, in feeling, tone and temper. They are more than graphic transcriptions of men and women in action, for they stress, particularly the French series, an authentic mood in each case plus an extra something of artistic élan and ingenuity in modeling. He has caught the elusive thrill of vibrant being and encased it in these bits of molten metal, thereby giving the souvenirs of a long travail their special significance and appeal. In achieving the color and patina of these bronzes, Mr. Young has been equally felicitous, and he makes it clear how dependent subtle modeling is on the right surfacing for its full revelation.

Hallie Davis.—At the Ferargil Galleries, Miss Davis exhibited recent studies of children, and proved how far she has gone since, as a native of the West Virginia mountains, she be-

gan her sculptural career by modeling in the mud of her native heath.

Miscellaneous Exhibits.—The New Society, showing this year at the Brooklyn Museum, had fine examples on view of the art of A. Stirling Calder, Gertrude V. Whitney, James E. Fraser, Edmond Quinn, John Gregory, and Mahonri Young. The annual Society of Independents and the regular Spring Salon gave opportunity for further display of sculptural talent unchecked by juries or other discriminations, although there was little or nothing that could be called notable. But taken by and large the season of 1928 can be said to have held its own in comparison with the average year in American sculpture.

WHITNEY STUDIO CLUB

Geissbuhler.—One of the most revealing of the year's fixtures in the field of sculpture was the first annual sculptural exhibition of the Whitney Studio Club, and this event served to bring to view the work of Arnold Geissbuhler, a most promising young artist. His work is startlingly mature and commanding for one yet to achieve a reputation, but it is evident that he will make his mark ere long. He possesses something of the innate gravity of the French sculptor Despiau; something of his tenderness of touch as well. He has style and an underlying ruggedness of structural form that asserts itself at first glance.

Other Exhibits.—Elizabeth Chase (Mrs. Geissbuhler) exhibited a fine bronze, and bore out the reputation she achieved at her first individual show a year or two ago. Gertrude V. Whitney exhibited models for her ambitious Columbus Memorial to be erected at the Port of Palos, Spain. Carl Walters, Concetta Scaravaglione, Reuben Nakian, Victor Salvatore, Jo Davidson (with still another portrait of Mussolini, to whom the American artist must be distinctly *persona grata* to judge from the lengthy line of heads for which he has sat to date), Salvatore Billotti, and Betty Burroughs were other prominent contributors. A vogue for beige colored materials appears to have set in among the artists, and there is a marked increase in the use of the lovely alabaster to be noted this year.

BRUMMER GALLERIES

John Storrs, from Paris, showed at the Brummer Galleries an interesting lot of sculpture, among which was a set of architectural inventions called "Studies in Form," in which he displayed his greatest skill and originality. In stone, bronze, and metal, he has devised geometrically-fashioned motifs that catch the modernistic note of the day in their linear, upstanding sprightliness, in their combination of contrasting metallic surfacings, and in their use of sharp-cut, plangent detail. He has provided hints aplenty within the slender compass of these little inventions for the reconditioning of the art of skyscraper construction, for the evolving of still newer, fresher forms expressive of the underlying structural principles of today. Towers, rich in the burnished metallic beauty that Mr. Storrs suggests, shorn of superfluous detail and symbolizing the shining efficiency of this mechanical age, would make our existing skyscrapers tame in comparison. Mr. Storrs' little terra cotta figures were likewise admirable.

Gaston LaChaise, also at the Brummer Galleries, presented works running from the delicately precise and neatly contained to the highly provocative and extra flamboyant. He shifts from one widely contrasted field of sculptural endeavor to another, but without maintaining any particular technical excellence or stamp of individuality as Nadelman, likewise a worker in widely separated departments of the plastic arts, does so brilliantly. But in a particularly experimental period in art, it is perhaps not impossible to reconcile such widely diverse achievements as the sensitively modeled portrait head of Dr. J. B. Murphy and the two huge, somewhat grotesque figures that mark Mr. LaChaise in his most expansive mood. One of these female figures, in bronze, is a commanding spectacle of its kind, but the other, yet in plaster, is a rather crudely conceived *tour de force*. Many of the LaChaise por-

traits are only moderately successful from the point of view of characterization, but he is a man decidedly to be reckoned with.

ARCHITECTURE

By Harry F. Cunningham

Member, American Institute of Architects

GENERAL CONDITIONS

Architecture—like everything else—must move forward or backward. It cannot stand still. American architecture just now is in a curious state of unrest that results from a sporadic effort to move it forward without providing a necessary background from which a proper forward movement might be possible. The net result of these efforts (some will want to call them misguided) to march forward in tune with the times, is—so far at any rate—rather unsatisfactory. It is, therefore, a falling back rather than a moving forward. To call a thing "modern" does not necessarily make it so. To copy one of Edgar Brandt's iron designs in terra cotta and drape it about the "waist line" of a building, does not make that building "Architecture" by any means, no matter how tall the building may be nor how much the lot on which it is built may have cost. A proper forward movement in architecture must be preceded by a careful preparation, provided with an adequate background. The so-called "Modern Movement" in architecture concerns itself no more with preparation than it does with background. Its major apostles endeavor to "lighten ship" by throwing everything—even caution—overboard. The ultimate effect will perhaps be good. The present symptoms are discouraging.

ARCHITECTURAL ACCOMPLISHMENT

Mr. Bok's Bell Tower.—Mr. Medary of Philadelphia has just completed an original and very beautiful bell tower in Mr. Bok's Florida Bird Sanctuary. This is to house a carillon of bells. Why the birds, which doubtless enjoy the quiet peacefulness of a Florida sanctuary, should be invited to live with a carillon is something that Mr. Bok knows better than any one else. But the tower is very lovely, with wonderful sculpture by Lee Lawrie, and gorgeous colored tracery in tiles by the Enfield Potteries. The birds may be willing to accept the carillon in order to have the tower. They will enjoy the tower. It is quite the finest thing (exclusive of several that have been noted in previous issues of The American Year Book) that has been produced in the United States for some years.

New York Central Building.—One of the biggest buildings of the year is the New York Central Office Building just north of the Grand Central Station and facing up Park Avenue. This enormous building, making the greatest possible private use of public property, is in the best "Pompier" manner of some twenty years ago. As it is not at all "modern" in any sense save in size and cost and possibly equipment, it marks one of the greatest steps in the present backward tendency shown in American Architecture.

Churches.—The building of churches goes on with great strides. The Cathedrals of St. John the Divine in New York and Saints Peter and Paul in Washington have made great progress during the past year. Mr. Cram is the architect of the former and Messrs. Frohman, Robb and Little of the latter. The Rockefeller Church for Dr. Fosdick in New York by Messrs. Pelton, Allen and Collens suffered somewhat from a fire recently. But the steel frame that is so cleverly concealed within the ostensibly "Gothic" stonework apparently suffered but little and the damage to the "Gothic" stonework will no doubt be speedily repaired. The great Chapel of the University of Chicago by the Goodhue Associates was recently

dedicated and has excited very favorable comment. The Church of the Heavenly Rest by the same architects (Mayers, Murray and Phillip), and the Temple Emanuel (by Messrs. Kohn, Butler and Stein), are nearing completion on upper Fifth Avenue in New York.

Tomb of the Unknown Soldier.—The recent competition for the completion of the Tomb of the Unknown Soldier in Arlington Cemetery near Washington, offered a fine opportunity for a very lovely thing. The result—in the present sketch stage—is rather disappointing.

ARCHITECTURAL EDUCATION

Nothing new or particularly interesting has developed during the past year in the field of architectural education. The schools are beginning to discover what everyone knew long ago; namely, that the best results in the Fine Arts are obtained through sympathetic collaboration between the practitioners of the several major arts. In the case of the perfect building, this collaboration would exist, of course, between the architect, the sculptor and the mural decorator. Some problems inviting such collaborations between students of these three arts have been given recently in several of the universities. The results have been—generally speaking—interesting. But professional educators, as a rule, discover the perfectly natural thing very late—if at all. Mr. Booth is developing a most interesting Arts and Crafts center in his School at Cranbrook, near Detroit. Many shops and ateliers are already finished and have their Master Craftsmen at work making beautiful things in pleasant surroundings. Such a combination of ample opportunities and agreeable surroundings in which to make the most of those opportunities should produce wonderful results.

THE LITERATURE OF ARCHITECTURE

Mr. Talmadge of Chicago and Dean Edgell of Harvard have each written a book on American architecture. Both books are well done and interesting. One will not agree with all of the conclusions of either author—but a book with which everyone agreed *in toto* would not be a very interesting, nor yet a very useful, book. The literature of architecture suffered a severe blow this year, through the discontinuance (temporary, it may be hoped) of the *Journal of the American Institute of Architects*. This magazine, generally very fine, supplied the Institute's one contact with its "market"—the Public. The discontinuance of the *Journal* is a sad blow to those architects who were intellectual enough to appreciate it, and a distinct misfortune in every way. It is hoped that the lack of foresight and understanding that brought this misfortune to pass may be remedied in the near future and that the Institute's publication will be resumed.

MUSIC AND THE OPERA

By Catherine Smith Bailey

Music Critic, *Christian Science Monitor*

THE SCHUBERT CENTENARY

The distinguishing feature of the year's music has been the celebration on Nov. 19 of the centenary of Franz Schubert's death. Various commercial organizations exploited it. Prizes were offered by different groups, and competition was keen. The results have widely varied and have drawn critical fire from many quarters. The great Schubert affair indulged in so extensively has certainly not resulted in the production of any masterpieces. The music which has drawn the largest amount of comment is that of Kurt Atterberg, who captured the $5,000 prize of the Columbia Phonograph Company for his Symphony in C major "in the manner of Schubert." The original

project of having the "Unfinished Symphony" finished by some modern hand was abandoned after scathing comments in critical columns.

The most satisfactory outcome of the Schubert festival was the large number of performances of the composer's works. Homage was done Schubert throughout the country by orchestras, choruses, and individual soloists. New York, as early as last spring, heard piano recitals by Katherine Bacon covering the entire field of Schubert's sonatas. The Philharmonic-Symphony, under Mengelberg, played the "Unfinished Symphony," the "Rosamunde" music, and Atterberg's prize-winning symphony. Sokoloff and the Cleveland Orchestra gave New York a first performance of the symphony begun by Schubert a year before the "Unfinished" but left in an incomplete form, apparently because Schubert realized it was below the quality of his best work. New York listeners seemed not to be deeply impressed with the version completed by John Francis Barnett. Other observances of the Schubert Centennial occurred at the Washington Festival in the spring when the Rose Quartet played Schubert's works; in Boston where two outstanding programs of the Boston Symphony Orchestra on November 16 and 17 included the "Tragic Symphony," No. 4, the "Unfinished," the B flat major, and the great Symphony in C major, as well as Schubert songs sung by Hulda Lashanska; in Chicago where on the same dates the Chicago Symphony Orchestra played the "Unfinished," the C major, an arrangement of Schubert's "Serenade" and of "Moment Musicale" in F minor.

OPERA

The Metropolitan in New York mounted Alfano's *Madonna Imperia* set to a libretto by Rossato after Balzac's story. Tullio Serafin conducted, and in the cast which proved not too rewarding for all the work involved in its preparation were Mmes. Müller Falco and Ryan, and Messrs. Jagel, Pinza, Wolfe, D'Angelo and Bada. This short work was put on the same program with Rimsky-Korsakoff's *Coq d'Or*. Puccini's three act *La Rondine* was given March 10 under the direction of Vincenzo Bellezza, with Joseph Urban as scenic director. This opera with a really brilliant second act but a rather unconvincing third had for its first New York cast Mmes. Bori, Fleischer, Falco and Alcock, Messrs. Gigli, Tokatyan and Ludikar. The first performance in America of Strauss's *Helen in Egypt* was at the Metropolitan, Nov. 6, Bodanzky conducting, Maria Jeritza in the leading rôle. Whitehill and Laubenthal took the principal men's parts. Respighi's *The Sunken Bell*, based on Hauptmann's play, had its first American performance Nov. 24 at the Metropolitan, Serafin conducting, Rethberg and Martinelli sharing the principal rôles.

American Opera Company.—New York had another season of the American Opera Company, that group of capable youngsters who developed their abilities at the Eastman School of Music and who have now established themselves with American audiences throughout the country. Their repertory of operas in English now includes *Faust*, *Butterfly*, *Carmen*, *Martha*, *Pagliacci*, and *Figaro*, all done with modernized and effective stage management.

Philadelphia is favored with adventurers in operatic fields. The Civic Opera Company, Alexander Smallens director, put on Debussy's *L'Enfant Prodigue* and Glück's *Orpheus*. In the latter given in March, Mme. Matzenauer and Alma Peterson appeared as *Orpheus and Euridice*. During November came the American première of Strauss's *Ariadne auf Naxos*, possessed of musical beauty but lacking much stage action. The Philadelphia Grand Opera Company prepared a performance of Tchaikovsky's *Eugen Onegin* in Russian. Fabien Sevitzky conducted the performance March 8, and Maria Koussevitzky was the Tatiana. The same company put on the first American performance of Mussorgsky's *Khovanchina*, with a ballet trained and led by Mikhail Mordkin. Rubinstein's *The Demon* was given by these enterprising play-

ers in November. The Apollo Grand Opera Company, with headquarters in Philadelphia, gave a performance of *Crispino e la Comare* on April 19. From the Society for Contemporary Music, Alexander Smallens, conductor, came the first American hearing of Hindemith's one act opera Hin und Zurück, Apr. 22. This work which consumes only twenty minutes is scored for seven woodwinds and two pianos and calls for five singers and two speaking parts. The same program listed Isadore Freed's ballet *Vibrations* for its world première, with Riva Hoffman and her dancers, and, in addition, Stravinsky's *l'Histoire du Soldat.* At this first Philadelphia performance of a work which has, in the words of a German critic, "given the first impulse to all those who wanted to get rid of traditional opera but had not found the courage to carry out their intentions," the cast was the same as that at the first American performance before the League of Composers, a New York organization.

Chicago, with its Civic Opera Company, saw a year which encompassed several revivals, but no novelties. *Linda di Chamonix,* worn thin through many years, *Sappho, Monna Vanna* with its effective second act, Catalani's *Lorelei* with its many instances of Victorian inefficiency, Strauss's *The Bat,* Rimsky-Korsakoff's delightful *The Snow Maiden* (done in English in a thoroughly successful performance), *Hansel and Gretel* and Cadman's *Witch of Salem* complete the list of fresh productions. The 1927-1928 season brought Heinrich Schlusnus, Vanni-Marcoux, Leona Kruse, Olga Kargau and Lucille Meusel as new comers, while for 1928-1929 the company announced Maria Olszewska, contralto from Vienna and London, Frida Lider and Eva Turner as the principal additions to the casts. In an American contingent of singers newly added this year are included Alice Mock, Alice Burke, Antonietta Consoli, and Patricia O'Connell. The conductors continue Giorgio Polacco, Roberto Moranzoni, and Henry G. Weber. Revivals for the 1928-1929 season include *Figaro, Don Giovanni, Tales of Hoffman,* Bellini's *Norma,* Ravel's *L'Heure Espagnol* and Honegger's *Judith* on a double bill (these with Mary Garden), Puccini's *Il Tabarro* and *Gianni Schicchi,* Strauss's *Rosenkavalier,* and Mussorgsky's *Boris.*

Los Angeles profited by the activities of the Opera and Drama Guild for ten weeks during the spring, when alternating weeks of dramatic and operatic performances were given. The organization offered to promising young operatic singers of the vicinity an opportunity to familiarize themselves with the routine of this kind of work.

Minneapolis gave to a work by a local composer, Alberto Bimboni, a first performance in January of the current year. This opera *Winona,* with a libretto by Perry E. Williams, has a background of Indian legend, and was well received at its première.

Smith College.—The movement to resurrect old and little known works of genuine worth has received a tremendous impetus during the past few years throughout the country. At Smith College, Werner Josten, head of the music department, has been particularly fortunate in his discoveries. Last spring he disclosed to an enthusiastic audience two operas of rare beauty, giving them their first American performances. Monteverdi's *Il Combattimento di Tancredi e Clorinda,* important historically as well as musically in its use of two singers, two mimes and a narrator, is a setting out of Tasso's *Gerusalemne Liberata.* The other work, built on a larger scale and in a more sportive vein, was Handel's comedy of *Xerxes.* For this opera Mabel Garrison emerged from semi-retirement to sing the leading feminine rôle, and Charles Kullman was heard as the king. For the chorus, Smith students and others were secured.

ORCHESTRAS

New York Philharmonic-Symphony.—The year has witnessed a steady and continuous growth of orchestras and audiences. The long established organizations hold firm, for

the most part. In New York, however, there occurred an important change when, in May, the Philharmonic Orchestra and the New York Symphony Society merged. One hundred and six players were held for the combined orchestra which is called the Philharmonic-Symphony Society of New York. The regular conductors of this new group are Arturo Toscanini and Willem Mengelberg, and the guest conductors Walter Damrosch and Sir Thomas Beecham. A double series of concerts during twenty-eight weeks of the 1928-1929 season will provide for the patrons of both original groups. Many New Yorkers saw the merging of the long established orchestras with much regret since it involved the practical disappearance of the New York Symphony Society, built up through fifty years of work by the Damrosches. Philharmonic policies prevail, and the bulk of the "principals" are from this latter group. During 1928, while each orchestra retained its identity, Fritz Busch, Arturo Rodzinski, Maurice Ravel, Oscar Fried and Enrique Arbos appeared as visiting conductors. Under Walter Damrosch's leadership, Holst's *Egdon Heath*, written for this orchestra, had its first performance Feb. 12. The Philharmonic enjoyed a list of conductors nearly as long as that of the Symphony Society since Sir Thomas Beecham, so-called *Knight of British Opera*, Willem Mengelberg, Bernardino Molinari, and Toscanini were heard from January to April.

The merged Philharmonic-Symphony, heard in New York during the autumn under Mengelberg, was judged by Lawrence Gilman better than either of its component parts, "a younger sounding orchestra, . . . more alert and buoyant, . . . yet the plangent richness, the deep ancestral beauty, the mellow thunders of the old Philharmonic have not been sacrificed." Mr. Henderson disagreed, finding "the tone thick," and "the touch heavy."

The Leaderless Orchestra.—Perhaps it is humorously appropriate that New York, which goes to hear conductors rather than orchestras, should have been the scene of "the first appearance in America of a symphony orchestra without a conductor" on Nov. 3, when the American Symphonic Ensemble played a Beethoven program of the *Eroica Symphony*, the Violin Concerto (Max Rosen) and the Egmont Overture. This group of players is run on a purely cooperative basis, and is governed by an executive committee elected by the musicians. A committee of five members decide questions of interpretation. The concertmaster sits, back to the audience, in the place usually held by the conductor. Listeners agreed that the results of this experiment were astonishing, but the large number of rehearsals which preceded the performance helped the smoothness of the playing. The origin of the leaderless orchestra was in Russia, where in 1922 in Moscow an organization of this sort appeared. Leipsic, Berne and other European cities now have similar orchestras.

Chicago.—Another city which saw an orchestral upheaval the past year was Chicago. No private funds were forthcoming from interested individuals, and the players finally agreed to terms which meant a return to the original eighty dollar a week minimum with a rising scale of wages extending over three years, at the end of which time the demanded minimum of ninety dollars a week will have been achieved. To meet the new monetary demands increased prices are charged for tickets to the concerts. The Chicago public has made a reassuring response, and the orchestra is now laying plans confidently three years ahead. Frederick Stock continues as conductor of the Chicago Orchestra, with Eric DeLamarter as assistant conductor. In January, memorial concerts were played for Theodore Thomas, founder of the Chicago organization and America's greatest orchestral pioneer. During January, also, Maurice Ravel appeared as soloist in a program of his works, and in April audiences heard Percy Grainger conduct. Modernists loom large on programs made by Mr. Stock and the past year has witnessed perform-

ances of many new works by American and foreign contemporaries.

Chicago now houses, in addition to the regular Symphony Orchestra, a Woman's Symphony Orchestra of which Ethel Leginska is the conductor and Miss Ebba Sundstrom assistant. A concert in November by this group under the direction of Miss Sundstrom revealed spirited and well-executed readings and included a performance of two movements of a "Gaelic" Symphony by Mrs. H. H. A. Beach, unheard in Chicago since 1898 when Theodore Thomas gave it its first performance. The maintenance of a training school for Symphony players by the Civic Music Association and the Orchestra Association is an encouraging indication of intelligent planning for the future of this body of players, and lends to the enterprise an element of permanence lacking in many orchestras. André Skalski has organized a symphonic body of seventy players, many of them drafted from Mr. Stock's orchestra, and on November 20 the men gave their first concert, a program of Russian music. Mr. Skalski displayed his talent for symphonic direction at this concert.

Cincinnati welcomed Fritz Reiner back as conductor in January after an absence of eight months, during part of which time he had appeared as conductor of the Philadelphia Orchestra with considerable success. The programs under Reiner continue on the high plane he has achieved, and the soloists are of recognized worth. Modern writers find sympathetic performances for their works at Reiner's hand.

Detroit.—After ten years of constant work with the Detroit Symphony Orchestra, Ossip Gabrilowitch has taken a year's leave of absence. Appearances as a soloist and as guest conductor with various organizations have occupied his year. In Detroit Georg Schneevoigt took over the bâton for a period. During the summer, Victor Kolar, the associate conductor of the orchestra, led nightly concerts in the city's natural park, Belle Isle, where his men played from an especially constructed sounding shell.

Cleveland observed the tenth anniversary of the founding of its Symphony Orchestra Dec. 11. During this decade, Nikola Sokoloff has been the sole conductor, and he has built an orchestra which ranks with the finest in the country. John L. Severance, who made the beginnings of the orchestra possible, has offered $1,000,000 toward the construction of a permanent hall for the orchestra. The balance is to be raised among Cleveland citizens, and the hall will be placed in the group of fine buildings of Cleveland's Educational Center.

St. Louis.—The Symphony Orchestra did not acquire a permanent conductor to replace Rudolph Ganz, but heard, instead, a group of guest conductors who included Bernardino Molinari, Ethel Leginska, Eugene Goossens, and Emil Oberhoffer. Under the leadership of the last of these conductors, a performance of the Ninth Symphony of Beethoven was successfully encompassed.

Minneapolis continues to listen to its Symphony Orchestra under the leadership of Henri Verbrugghen; initiative and zest are in his programs and performances; a tour is now part of the season's work.

Los Angeles.—Through the generosity of William A. Clark, Jr., the founder and supporter of the Los Angeles Philharmonic Orchestra, that city is now assured permanent support. Beginning with 1930, there will be a fund of $1,000,000 available for the support of the orchestra. Georg Schneevoigt, conductor, has organized an extensive program of concerts which include fourteen regular pairs of concerts, fourteen popular concerts, ten radio concerts, and appearances in surrounding towns. The summer season at the Hollywood Bowl drew able conductors as guests, including Coates, Molinari, Casella, Grainger, Goossens and others. In addition to the regular orchestra, Los Angeles enjoys the activities of Adolf Tandler's Little Symphony which performs new works by writers such as Cowell, Bliss, and Stravinsky as well as rare works of old masters.

San Francisco.—The Symphony Orchestra progresses under Alfred Hertz.

Municipal as well as subscription and popular concerts are given, and works by American writers are often played. For the summer season Coates, Molinari and Gabrilowitch were procured as conductors by the Summer Symphony Association.

Philadelphia. — During January, while Mr. Stokowski, conductor of the Philadelphia Orchestra, was on a leave of absence, four guest conductors led the players. Ossip Gabrilowitch, conductor of the Detroit Symphony Orchestra, and who was the first soloist ever to appear with the Philadelphia Orchestra, led the list. He was followed by Willem Mengelberg, Sir Thomas Beecham and Pierre Monteux. The last-mentioned conducted the season of regular concerts, which was followed by a group of festival concerts led by Fritz Reiner. Mr. Reiner had been in Philadelphia during the first half of the season as conductor. The autumn found Mr. Stokowski again able to lead the concerts, and he reappeared, to general acclaim and with excellent effect on his men both in Philadelphia and in New York. At the end of November, he again left his orchestra in the hands of guest conductors, planning to return in March when he will complete the season. During December, 1928, and January, 1929, Mr. Gabrilowitch held the bâton of Mr. Stokowski.

Rochester.—The Philharmonic Orchestra under the leadership of Eugene Goossens continues to devote itself in large part to interesting programs of works by American writers. The presence in the city of the Eastman School of Music with its constant encouragement to young writers helps foster and emphasize this tendency of Mr. Goossens.

Boston.—Serge Koussevitzky continues his leadership of the Boston Symphony Orchestra and continues to secure for his programs important first hearings of compositions. In January, when Mr. Koussevitzky took his customary mid-winter vacation, Maurice Ravel made his first appearance in America as a conductor. The following week brought Sir Thomas Beecham who displayed his customary vigors and abilities. Mr. Koussevitzky continues the policies which have raised the Boston orchestra to its present high position. It now owns a group of performers of such fine individual ability that hardly another orchestra in the world can boast such men within its ranks. The conductor has combed the musical capitols of the world for his players and the results are plain to the listeners.

AMERICAN COMPOSERS

Ernest Bloch.—Of all the compositions of the year, that of Ernest Bloch, entitled "America," which won the *Musical America* prize of $3,000, has probably attracted the most attention and the most extended comment. Written with all the masterly workmanship which Bloch can command, but with no great amount of the inspiration and individuality found in many of his other works, this newest of his writings was given a distinguished presentation when five of the largest symphony orchestras in the country presented it simultaneously. In New York, in San Francisco, in Boston, Chicago and Philadelphia, Mr. Bloch's "Epic Rhapsody" in three parts for orchestra and concluding with an anthem to America sounded out before large audiences. The five conductors were the five judges who unanimously chose the work from 92 scores submitted in the competition. The first movement takes "America" up to 1620, the second deals with melodies of the Civil War period, the third deals with the present and the future. Critical opinion of the work has varied. Some writers found it a masterpiece, others discerned in it faults not common to other works by the composer. But it has been the outstanding work of the year, from a news point of view. Whether it will survive and whether its anthem will become the national song its composer hopes it will remain to be shown by succeeding years. At present, its future seems not too promising.

Contemporary Works.—At the Copland-Sessions concerts in New York City, organized by Aaron Copland and

Roger Sessions, prophets of modernism, contemporary works were given before interested audiences. In the list works presented were a Sonata by Carlos Chavez; three pieces for flute, clarinet and bassoon by Walter Piston; a quintet for piano and string quartet by Mrs. H. H. A. Beach: Virgil Thomson's setting of five phrases from the "Song of Solomon," two pieces for string quartet by Copland, and various other works. Under the auspices of the New York Historical Society, a concert of the works of Gottschalk, Foote, Bauer, Whithorne, Powell, Ives, Hanson Cowell and Copland was given on May 1. The Harrisburg Festival fostered a performance of Hadley's "Myrtil in Arcadia," described by one reviewer as an "important contribution to American choral music." In New York, George Antheil's String Quartet, showing a very different characteristic from his "Ballet Mécanique," was heard. From Whithorne came incidental music to O'Neill's *Marco Millions* of definite worth. Copland's Scherzo, a skillful study in rhythms, found performance in Cincinnati and many other cities. The Chicago Symphony Orchestra found room for Deems Taylor's "Jurgen" and Schoenefeld's "Concerto" for 'cello and orchestra. In the lists of the Boston Symphony Orchestra were Frederick Converse's "California," and Edward Burlingame Hill's "Symphony in B Flat," a work of sound individuality and rhythmic vitality. Sowerby's "Mediæval Poem" for organ and orchestra had a second hearing from the orchestra in his home city, Chicago. In the section on Chamber Music will be found further instances of performances of works by Americans, a tendency of sure and strong growth, encouraging to native students and instructors, and of vital significance for our musical future.

CHAMBER MUSIC

Quartet Changes.—Chamber music prospered during 1928, due in large part to the impetus given it at the festivals organized by Mrs. Coolidge at Washington and the series of concerts she gives to the public throughout the country. Some important changes, however, should be noted. After 25 years of pioneer service during which time they took chamber music to audiences constantly more and more appreciative, the Flonzaley String Quartet are disbanding. Only in the Roth String Quartet come this season from Budapest originally for the Berkshire Festival have critics discovered players who might replace the long established Flonzaleys. Another quartet of recognized first rate abilities which the public lost during the year is the Persinger String Quartet which gave a final concert on March 19, in Los Angeles, its home.

Philadelphia.—The Philadelphia Society for Contemporary Music sponsored Leo Ornstein's newest and most significant work, a quintet for strings and piano, as well as other compositions. There is now organized in Philadelphia the Curtis Quartet, composed of heads of the string departments at the Curtis Institute and including Carl Flesch, Louis Bailly and Félix Salmond. An interesting event occurred in Philadelphia at the very close of the year when the four prize winning compositions of the Musical Fund Society $10,000 contest for chamber music works had their first hearing anywhere. These were a string quartet by Bela Bartok, a serenata for clarinet, trumpet, bassoon, violin and violincello by Alfred Casella, a string quartet by Carlo Jachino of Parma, Italy, and a piano quintet by H. Waldo Warner, viola player of the London String Quartet. The works were played by the first-chair men of the Philadelphia Orchestra.

Chicago and Boston.—Other organizations which foster performances of chamber music are the Chicago chapter of the International Society for Contemporary Music, the Boston Chamber Music Club and the Flute Player Club of that city (the latter achieve particularly distinguished programs) and the Society of American Women Composers.

MUSIC FESTIVALS

Elizabeth Sprague Coolidge.—The number of music festivals celebrated

in the United States during the spring and summer seasons grows each year, and include music and musicians of every type. The most distinguished are those sponsored by Mrs. Elizabeth Sprague Coolidge, who brings to these musical events performers, of the highest quality. She has endowed an annual festival of chamber music to be held in Washington under the auspices of the Library of Congress for a hundred years. For the Washington Festival, many works are commissioned. Last April Respighi's "Spring," "Adoration of the Magi" and the "Birth of Venus" were given their first performances. Stravinsky's "Apollo Musagetes," a charming ballet for six string instruments and four dancers, was presented, with Adolf Bohm, Elise Reiman, Berenice Holmes and Ruth Page for the dancers. This masque-in-the-small is a completely organized work. For this festival, the Rosé String Quartet, a remarkable group of players, were brought over, as were the members of the Parisian Société des Instruments Anciens. Among the works performed other than Stravinsky's and Respighi's were Casella's "Sonata in C" for piano and 'cello, a quartet by John Alden Carpenter and Hindemith's "Spielmusik."

September 19, 20, and 21, Mrs. Coolidge gave what she called the Berkshire Anniversary Festival, marking the decade which has passed since the first of the Berkshire Festivals was given. From the group of connoisseurs who gather at Pittsfield to hear music by string quartets and small chamber orchestras has spread the cult of chamber music in this country. At the anniversary festival, there were performed David Stanley Smith's "Sonata in A minor" for violin and piano, op. 51, played by Rudolph Reuter and Jacques Gordon. Malipiero's "Sonata a Tre," Reger's "Sextet in F major" for 2 violins, 2 violas and 2 cellos. a Quintet for 2 violins, 2 violas and a cello by Martinu, and Salzedo Pentacle for 2 harps. These and other compositions were played by the Gordon String Quartet, the Roth String Quartet of Budapest, the South Mountain Quartet of Pittsfield, and the original Berkshire String Quartet.

Worcester.—There is held here one of the oldest if not the oldest annual music festivals in America. This year on October 3, 4, 5, and 6, concerts of brilliance and effectiveness were encompassed. Mr. Albert Stoessel has so revivified these long established events that they rank among the finest in the country. This year Purcell's rarely lovely "Dido and Æneas" and Schmitt's Psalm XLVII opened the festival, drawing reviewers from distant cities to listen to this and the other performances. In the course of the festival, an excellent American program was given.

In Philadelphia the annual festival of the National Association of Harpists took place during March. At that time the first American performance of André Caplet's "Fantastic Tale" for harp and string was given by Carlos Salzedo and the Curtis String Quartet, Three Songs by Salzedo for soprano, 6 harps, oboe, bassoon, and French horn, and Ravel's Introduction and Allegro for harps and string orchestra were played.

The Bach Festival took place at Bethlehem, Pennsylvania, in May, when Dr. Wolle again conducted works by Bach which included the charming "Art of Fugue."

Other Festivals.—Chicago was the scene of the convention of music supervisors at which programs were given by the National High School Chorus and Orchestra. Keene, N. H., celebrated its annual spring festival in May with a performance of *Faust*. Mills College organized a rather distinguished festival to celebrate the opening of a new music building and auditorium given by Mrs. Coolidge. The music included Pierné's "Sonata da Camera," Lefebvre's "Suite for 5 winds," Beethoven's "Quintet for Winds," and Brescia's "Suite for Five Wind Instruments and Piano." Maier and Pattison, pianists, the Persinger String Quartet and the Smallman A Cappella Choir took part. San Francisco celebrated a Spring Festival conducted by Alfred Hertz with the San Francisco Symphony Orchestra, a

Municipal Chorus and distinguished soloists to perform music by Bach and Verdi. The Festival of the Philadelphia Orchestra brought Fritz Reiner again to that city to conduct performances of Strauss's "Don Quixote," Honegger's "King David" and excerpts from "The Ring." Harrisburg observed a Mozart Festival which saw the first American performance of Mozart's "C minor Mass," and the world première of Hadley's "Myrtil in Arcadia," the prize composition of the Sesquicentennial exposition contest. Mr. Ward-Stevens directed the Festival. At Ann Arbor, Michigan, the thirty-fifth annual May Festival was observed with compositions by Pierné, Grainger, Herbert Hyde, Eric DeLamarte and Earl Moore listed on the programs. Frederick Stock directed the Chicago Symphony Orchestra for these concerts. At Evanston, the Chicago North Shore Festival was given for the twentieth year and included five concerts by the Chicago Orchestra, German male vbice choruses and others.

CHORAL MUSIC

Important events in choral music occurred with the first American performance of Hindemith's "Marienleben" done in New York under the auspices of the League of Composers at the very close of 1927. During February, the Boston Symphony Orchestra and the Harvard Glee Club, assisted by Matzenauer, Hackett and Gange, gave the first American hearing to Stravinsky's "Œpidus Rex," an intensely dramatic work which showed a synthesis of various styles. During April, there were two performances of Honegger's "King David," the one in Boston by the Symphony Orchestra there, the Harvard Glee Club, the Radcliffe Choral Society and soloists, the other in Philadelphia by the Mendelssohn Club and the Philadelphia Orchestra directed by Fritz Reiner.

THE THEATER

By J. Brooks Atkinson

Dramatic Critic, *The New York Times*

TENDENCIES

Although the dramatic year began energetically with a host of interesting and stimulating productions it ran down tamely during the autumn season. As usual the total number of productions, both musical and dramatic, approximated 300, and the number of successes was something less than a third of that figure. Every producer decried the over-production that resulted in a large number of stop-gap adventures. Nevertheless, two or three new playhouses were added to the large number already looking for anything that might help pay the rent and the operating costs.

O'NEILL'S "STRANGE INTERLUDE"

Certainly the most interesting production of the season was Eugene O'Neill's "Strange Interlude" which the Theater Guild mounted in February. Already Mr. O'Neill's opulent and poetic pageant, "Marco Millions," was on the boards and attracting large audiences to enjoy the beauty of the ideas and the production. But "Strange Interlude" had novelty as well as fierceness to recommend it. Since it was written in nine acts, the performance began soon after five o'clock in the afternoon and continued, with one intermission for dinner, until eleven. Throughout the year it was one of the most popular plays and one of the most difficult for which to buy seats. After the original cast had played it, and finely, for nearly six months the Guild released some of them from the heavy nervous strain of such a long performance, and replaced them with other good actors. There was so much interest in the play out of town that in December the Guild organized a road company, with Pauline Lord in the chief rôle. The indications were

that the road company would find sufficient interest in "Strange Interlude" in other parts of the country to keep it touring for a year. Meanwhile, there has been no sign of flagging interest in the play in New York.

Its most conspicuous technical innovation was the use of the old-fashioned "asides" as integral forms of expression. The characters spoke their private thoughts in addition to the usual dialogue of the play. "Strange Interlude" set down bluntly the story of a woman in search of physical and emotional peace. Having lost her affianced in the war, without ever having fulfilled her devotion to him, she sought release from the complexities of her emotion in and out of wedlock. The play carried her and her three chief male admirers from youth to middle age. In all her experiences the image of her first love persisted as an obsession. As usual, Mr. O'Neill charged his play with the fury of which he is capable. Although some commentators were reluctant to praise it too highly, many heralded it enthusiastically as the "great American play."

THE THEATRE GUILD

The progress of the Theatre Guild from a local institution to an important factor in the entire theatrical life of the country was one of the most notable developments in the season. A revival of "Faust" in the autumn was a failure and a revival of Shaw's "Major Barbara" was not a conspicuous success. But "Strange Interlude," "Marco Millions" and Stefan Zweig's adaptation of Ben Jonson's "Volpone" were all fine examples of play selection and production, and "Wings Over Europe," by Robert Nichols and Maurice Browne inspired vaulting science with the beauty of poetry. In the autumn the Guild began to send companies to other parts of the country with some of its best liked plays. With 25,000 subscribers already enrolled in New York it began to gather almost as many in other cities for a brief season. Before the year was over it had seven companies under its direction. One of them was booked on the road for an entire theatrical season through the country to the Pacific Coast. From the interesting experimental group of Washington Square Players of wartime the Theatre Guild had grown by logical advances into the foremost theatrical institution in the United States.

OTHER THEATRICAL EVENTS

"The Front Page."—No particular "trend" of things theatrical was to be discovered in the other affairs of the season. "The Front Page," by Ben Hecht and Charles MacArthur, was the most successful of the purely competitive enterprises. Produced by Jed Harris, who had begun his career sensationally with "Broadway," and directed by George S. Kaufman, co-author of "The Royal Family" and author of many plays, "The Front Page" represented melodrama and vigorous dramatic writing fully exploited in a loud and rapid performance. From their journalistic experiences in police headquarters in Chicago the authors have drawn an exciting crime story and many startling expert bits of character portrayal. None too finicky about their dialogue they dropped in vulgarisms and blistering oaths in great abundance. Although many people cried out indignantly at the bawdiness of the conversation, apparently no one in New York stayed away from the playhouse.

"Gentlemen of the Press."—Just as "The Front Page" had broken the unwritten law that no good play could be made out of the newspaper profession, "Gentlemen of the Press," by Ward Morehouse, opened with a chronicle not of the police headquarters pressroom but the grinding city room of a metropolitan newspaper. The story was the sentimental yarn of a star reporter who abandoned his magic craft to become a press agent at a high salary. Despite the luxuries of his new trade he was drawn irresistibly back to his old city desk. Although "Gentlemen of the Press" was less successful than "The Front Page," many playgoers believed that it gave a truer and more comprehen-

sive picture of the newspaper profession, and it had a creditable career.

Melodrama. — The influence of "Broadway" of two seasons before still lingered in the ebullient melodramas of underworld life. "Night Hostess," by Philip Dunning, one of the two authors of "Broadway," shuffled the same elements of night club and gambling life into a new pattern, and flourished all through the autumn season. Two melodramas came to bring the news of graft and corruption in the prize fight ring, and both of them were financial failures. "Ringside" was the joint product of Edward E. Paramore, Jr., Hyatt Daab and George Abbott, who was the other author of "Broadway," and it followed the unsavory career of a champion into the prize ring where he saved his honor in spite of the foul machinations of the gamblers. Only a week or two later another melodrama, very similar in story to the first, set up shop only a door or two away. It was entitled "The Big Fight," and it boasted for its chief attraction Jack Dempsey in person. Although the preliminary interest was great, Mr. Dempsey proved to be a better fighter than an actor, and his play lasted only a short time.

"Elmer the Great."—At about the same time Ring Lardner's dramatization of his baseball stories, "Elmer the Great," opened with George Houston in the principal part. Although Mr. Lardner's dialogue was uproariously amusing, and Mr. Houston gave one of the best character portraits of the season, the play was so speciously contrived that it did not endure very long.

RELIGION AND CRIME

The drama of iconoclasm resulted in two attacks on religion and one that attacked both religion and college instruction. None of them succeeded. The first was Patrick Kearney's dramatization of Sinclair Lewis's lampoon against the clergy, "Elmer Gantry." Much was done to make the play sensational, but it was too transparent and without skill in artifice. Harry Wagstaff Gribble's "Revolt" against the obsessions of the clergy was so hysterically overstated that it lost point. In "Hotbed" Paul Osborn impinged a fanatical religious reformer upon the narrow-minded faculty of a provincial college, and told the bitter facts about both. No one was greatly interested. In fact, the drama of debunking seemed no longer to interest the public unless it happened to be good drama at the same time.

"Gods of Lightning."—By using without much editing the raw facts of the Sacco-Vanzetti trial for murder, Maxwell Anderson and Harold Hickerson wrote a grimly stirring drama entitled "Gods of Lightning" which won instant admiration, but found audiences somewhat reluctant to come. Although the course of the story was a foregone conclusion as soon as the curtain rose, the authors had told their story so forcefully and the actors played with such simple fervor that the effect was cruelly disturbing in the theater. As special pleading "Gods of the Lightning" was one of the most effective plays ever produced.

COMEDY

"Queen's Husband" and "Jealousy." —Robert E. Sherwood, author of "The Road to Rome," produced another ironic comedy entiled "The Queen's Husband," with Roland Young interpreting that lady's mild spoken consort. It was less successful than "The Road to Rome," but Mr. Sherwood's style of humor and Mr. Young's languid acting kept it running for several profitable weeks. John Halliday and Fay Bainter were the actors in a novel melodrama with only two characters, entitled "Jealousy," and adapted from the French of Louis Verneuil by Eugene Walter. Although only two characters appeared on the stage the telephone turned the play into the usual triangular situation. If the play had little quality as a drama it was ingenious as a novelty and splendidly acted by the two players.

"Mr. Moneypenny."—In an expressionistic cartoon Channing Pollock attacked the daily philosophy of materialism in a noisy and picturesquely

episodic morality play entitled "Mr. Moneypenny." The play was more original in its style of expression than in its philosophy. Zoë Akins was the author of a lush and grandiose play entitled "The Furies" in which Laurette Taylor gave one of the finest performances of her career. Although the play was pretentious with overtones of the great forces in life, it sounded hollow, and it failed.

"Exceeding Small."—One of the truest plays of the season was "Exceeding Small" by a new playwright, Caroline Francke. Concerned with a young married couple, it developed the tragedy of wedded life on slender financial resources when an unforeseen disaster intrudes. By virtue of excellent acting by Eric Dressler in the leading part, "Exceeding Small" aroused a good deal of admiration.

"The High Road."—Another smart comedy by Frederick Lonsdale, "The High Road," was well liked in the autumn for the fine turning of the lines and the finish of the acting by an English company with Edna Best in the principal rôle. As usual Mr. Lonsdale was pricking the complacence of a well-born English family with the neatness of his dialogue. Although "The High Road" did not equal his "Last of Mrs. Cheney" of two or three seasons before, it was a pleasure in the midst of a phlegmatic autumn season.

"Our Betters."—Somerset Maugham's new play "The Sacred Flame," seemed endlessly loquacious if not a little insincere, and it did not endure beyond three weeks. In the spring his "Our Betters," a comedy of the socially ambitious Americans in London, was a success, with Ina Claire brilliant in the leading part. When it was originally produced at the beginning of the war "Our Betters" had offended the sense of good taste in international relations at that hysterical time, and it had been withdrawn before it gave offense. In 1928 everyone enjoyed it for the skill of its craftsmanship and the piquancy of its theme.

"Holiday."—Early in December Philip Barry, whose "Paris Bound" was one of the most enjoyable comedies of the season, produced another balloon of gay humors in "Holiday," introducing Hope Williams as a featured actress. Mr. Barry was again writing of well-to-do New Yorkers, and embroidering his story with light and spinning dialogue. Indeed, his dialogue was so brilliant in the temper of its day that his story of a young man who would not be rich became of subordinate interest.

DRAMA

"Machinal."—The only highly original and adventuresome drama of the autumn season was "Machinal" by Sophie Treadwell, with Zita Johann in the chief part. Miss Treadwell was portraying the tragedy of a weak girl in contact with the glib hardness of a mechanistic civilization. And she told it abstractedly in terms of expressionistic episodes and tatters of significant story. Too austere for popular consumption, "Machinal" lingered for two months or more as a moderate success. Arthur Hopkins had produced it splendidly with excellent acting and beautifully planned settings by Robert Edmond Jones. Both as a play and a production, "Machinal" was the only offering of the autumn season which brought something original into the theater.

"Mima."—After months of preparation and two months of arduous rehearsals, David Belasco opened in December one of the most stupendous dramatic spectacles for years, "Mima," adapted from Franz Molnar's "The Red Mill." It was a highly symbolic story of machinations in hell; the stage represented a huge machine, entitled the "psycho-corrupter," which could turn the purest man into the vilest fiend in the space of an hour or two. When the victim unexpectedly brought human virtue into hell, by forgiving his enemy, the elaborate machine collapsed. To tell this story Mr. Belasco had largely remodeled his theater to accommodate the complicated and massive stage setting. Although the story seemed dull and desultory, Mr. Belasco as usual proved himself a master of stage direction, and a wizard of lighting.

REVIVALS

Eva Le Gallienne.—Revivals were uncommonly numerous. Chekhov's "The Cherry Orchard" was revived twice, once rather dismally at matinees by James B. Fagan, and again brilliantly by Eva Le Gallienne's band of repertory actors with Nazimova playing the strategic part. In its third season Miss Le Gallienne's enterprise is now firmly established as one of the most influential art theaters in the country. Her revival of Molière's "Le Bourgeois Gentilhomme," under the English title of "The Would-Be Gentleman," was more burlesque than comedy. In November she mounted Barrie's "Peter Pan" successfully. But folk drama suited the talents of her company best, and "The Cherry Orchard" discovered them at the peak of their ability.

Other Revivals.—Ibsen's "The Wild Duck" was revived for the second time by Blanche Yurka; it had lost none of its brute force. In the spring George Tyler staged two "all-star" revivals, one of "She Stoops to Conquer" with Mrs. Leslie Carter, Lyn Harding and Fay Bainter in leading parts, and one of Sardou's "Diplomacy," with Margaret Anglin and William Faversham in the cast. The annual revival of The Players was Farquhar's "The Beaux' Stratagem," and it included Raymond Hitchcock, Kate Mayhew, Henrietta Crossman and O. P. Heggie. It was so delightfully entertaining that plans were made later in the season to stage it again for road producing under commercial management.

Shakespeare.—Of the Shakespearan revivals, "Macbeth," with scenic designs by Gordon Craig, was the most interesting. Florence Reed and Lyn Harding were Lady Macbeth and Macbeth, respectively. Although Craig had not designed the entire production, which might have given it a finer luster, the settings made from his drawings represented the first of his designs ever seen in the United States. In the spring Winthrop Ames presented a revival of "The Merchant of Venice" with George Arliss as Shylock and Peggy Wood as Portia. To many playgoers, Mr. Arliss's interpretation lacked the strength essential to Shakepearan acting. A revival of "The Merry Wives of Windsor" brought Mrs. Fiske, Henrietta Crossman and Otis Skinner together in an old-fashioned but spirited performance. Walter Hampden mounted "Henry V" with his repertory company at his own theater, playing the title rôle himself. On the whole, Shakespeare did not have much exhilaration in any of the season's revivals.

MUSICAL PRODUCTIONS

Florenz Ziegfeld.—As usual, the musical productions flourished. With "Show Boat" just produced Mr. Ziegfeld began his new year with "Rosalie," featuring Jack Donahue and Marilyn Miller, and followed it within a few weeks with "The Three Musketeers" with Dennis King in the swashbuckling part of D'Artagnan. In November Mr. Ziegfeld staged a musical version of Owen Davis's "The Nervous Wreck," entitled "Whoopee" with Eddie Cantor as the featured performer. With these three expansive and brilliant productions, staged with complete mastery of the musical stage medium, Mr. Ziegfeld quite maintained his preëminence in his field.

"Rainbow." — Laurence Stallings and Oscar Hammerstein, II, were the authors of a fine, romantic musical play of the Forty-Nine Gold Rush, entitled "Rainbow." Although it employed the traditional embellishments of a dancing and singing chorus, it crept closer to sweeping, romantic drama of a picturesque episode in American history than any other musical production. The authors had written the dialogue with a tang of authenticity, and the music and lyrics fitted the scheme with more than routine competency. "Rainbow" succumbed to various disastrous forces in less than a month.

Joe Cook and Marx Brothers.—Meanwhile, Joe Cook, an extraordinarily versatile comedian, was disporting in a popular show entitled "Rain or Shine," and the four Marx Brothers, already very popular in

New York, were appearing in another mad diversion entitled for no logical reason "The Animal Crackers." Written by George S. Kaufman and Morrie Ryskin, it combines a turbulent style of satire with the humdrum formulas of musical comedy.

"Three Cheers."—As the result of an airplane accident Fred Stone was temporarily incapacitated for his usual dancing stage attraction. Will Rogers, the cracker-barrel philosopher, quixotically took Mr. Stone's place in the production of "Three Cheers" in order that Dorothy Stone and her colleagues might not be too long delayed. Mr. Rogers's colloquial humors helped to make "Three Cheers" one of the best loved productions of the autumn season.

NEW REVUES

The new revues included an elaborate edition of Earl Carroll's "Vanities," a new and highly-popular, lightly satiric "Grand Street Follies," and an American version of a popular English revue, entitled "This Year of Grace," written by Noel Coward, already well known for "The Vortex" and other modish dramas. Since Mr. Coward appeared in the revue himself, and since Beatrice Lillie, a great comedian, appeared with him, "This Year of Grace" enjoyed great favor.

SUMMARY

By comparison with the preceding season the year of 1928 was desultory in the theater. With the exception of Mr. O'Neill's "Strange Interlude" the drama appears to have made no conspicuous progress; and no unknown dynamic personalities have come into the theater. If 1928 was, theatrically, by no means a "strange interlude" it was a quiescent one, and it left us a little disgruntled with the craft.

MOTION PICTURES

By Mordaunt Hall

Motion Picture Critic, *The New York Times*

SPEECH AND SOUND IN PICTURES

New Developments.—The past year was a significant one in the history of the motion picture industry, for in the early summer there was a sudden hysterical movement in Hollywood to produce talking films and those synchronized with sound effects. This rush to provide animated shadows with a voice came on the heels of the popularity achieved by William Fox's Movietone news reel and the financial success of the Warner Brothers' Vitaphone version of "The Jazz Singer." Some producers, realizing that both Fox and the Warners were well in the lead in the new scheme of things, were spurred to investigate other sound devices and to busy themselves with the construction of sound-proof studios.

Attitude of the Producers.—A few of the picture makers, including Charlie Chaplin, Samuel Goldwyn and Joseph M. Schenck, were far from enthusiastic. They feared that the reckless way in which their colleagues were going about fashioning audible pictures would not only cause a falling off in attendance at the cinemas of people who did not favor the spoken films, but also drive away others who might conclude that picture entertainments, even in silent form, were no longer to their liking.

Fairbanks and Chaplin.—Douglas Fairbanks declared that he would "try anything once," and he is said to have solved the problem of speech by having the words addressed to the audience rather than to the other characters. Mr. Chaplin's idea was to have everybody but himself speak in his next comedy. What changes of heart may occur during the making of these productions is problematical, however, and Chaplin may have just as much fun producing a talking film as he does in making a silent one. So far as the redoubtable Mr. Goldwyn

is concerned, his hope is that Vilma Banky and Lily Damity, respectively Hungarian and French, will soon learn enough English to meet the demands of the patrons of the spoken picture.

Handicaps and Criticism.—Among those who joined in the rush for sound effects were several who warned their fellows that more time was needed for experimentation with the electrical devices before they could safely be put on the market. It was also argued that not only were the instruments thus far devised far from perfect but that relatively few of the popular screen players were qualified to have speaking parts or to act in front of a microphone.

Problem of Foreign Actors.—Another important consideration in weighing the pros and cons of the talking shadows was the fact that most of the foreign screen performers were not sufficiently familiar with the English language to handle lines even when playing foreign characterizations, with lines in broken English. Among the players mentioned in this connection were Emil Jannings, Conrad Veidt, Greta Garbo, Vilma Banky and others who were under contract to various producers at large salaries. Mr. Veidt condemned the idea of a voice on the screen and declared that the motion picture would thus lose its artistic appeal and international value. A number of others were of the opinion that the motion picture with a voice would become little more than a "canned" play. To counteract this statement it was said by the students of sound that the cinematic value of the screen would be maintained; that there would be no canned play, but spoken lines linked with the photographic possibilities offered by the screen.

Attitude of the Theaters.—Managers of motion picture theaters joined in the rush for sound pictures and on the marquees of many theaters were emblazoned "Hear and See," sometimes when there was little more to be heard than at the hitherto silent offerings. Almost all pictures were synchronized with sounds and a music score, the sounds as a rule being the barking of a dog, the popping of a gun, the yelling of a mob, but chiefly the knocking on doors. None of this added one whit to the motion picture. Instead of a real orchestra there was a canned conception of music and the generous supply of sound effects were nothing more than the effects formerly produced by the orchestra and in some cases by imitative sounds backstage. The noises (for that's what most of the effects were) were in most cases not even as well synchronized as they had been by the orchestra.

SOUND FILMS

"The Patriot."—One of the finest pictorial works ever made, "The Patriot," was presented at the Rialto Theater with snatches of vocal and sound effects. They even gave Mr. Jannings, the "Mad Czar" Paul, a voice, and the words did not synchronize with the movement of the actor's lips, because the audible element had been manufactured in the East and some other man than Jannings supplied what there was of the damaging speech.

"The Shopworn Angel."—Toward the end of the year an otherwise lovely motion picture, called "The Shopworn Angel," was by no means helped by a speaking sequence. The vocal addition came in a marriage scene and chanced to have been a chapter where no words, not even a subtitle, were necessary. It was evidently jammed into the cinematic effort in order to provide grounds for exploiting it as a sound production.

"The Barker."—There were times when it seemed as though the producers were so enthusiastic about sound that they would recognize no bounds in providing audible effects. George Fitzmaurice produced an excellent film version of the play, "The Barker," but good as it was it was not permitted to be presented on Broadway without being inoculated with sound. It was another example of sound not helping the picture, for what might easily have been left to the imagination was heard coming

from the screen and the lines were far from adequate.

"The Singing Fool."—There were, however, some audible films which were highly commendable. Al Jolson, who sang his way to success in "The Jazz Singer," won even greater popular favor in "The Singing Fool."

"The Home Towners."—The Warners also made a good talking comedy out of George M. Cohan's, "The Home Towners." While this laughable adventure demonstrated that technical deficiencies could be overlooked in light vehicles, it also proved that if the same weaknesses were apparent in dramas they would heap ridicule upon the producers. "The Home Towners" had explosions of dialogue and passages where the voices were barely audible, but it sustained the comic angle, which was all that mattered.

"Interference."—Possibly the outstanding talking film achievement was the pictorial transcription of the play, "Interference." Technically this was unusually good, but had it been judged by dramatic standards it would not have come off so favorably, for there were many episodes in which the players appeared either to be awaiting the signal to speak, or to place themselves at the proper distance from the microphones.

"Napoleon's Barber."—The audible shadow version of the playlet, "Napoleon's Barber," a three-reel production, turned out to be so good that one actually forgot about the novelty of talking shadows and became interested in the narrative.

MOVIETONE SUBJECTS

G. B. Shaw.—And while writing about the good side of talking picture ventures, special mention should be made of some of the Movietone subjects, especially those of George Bernard Shaw and King Alfonso of Spain. Mr. Shaw's little entertainment was vastly interesting. It was simple and humorous and left one with the feeling that, after all, one had met this playwright of Adelphi Terrace.

King of Spain.—The speaking film of Spain's King was equally good. It was quite evident that while the American Ambassador was introducing the King, his Majesty was turning over in his mind what he was going to say to the people of the United States through the medium of this new invention. Even while the King was speaking he apparently forgot that his visage was to be seen on the screen from which his voice was to be heard. He was, obviously, thinking of his speech and of his voice and, as he addressed the Movietone camera, he twisted his mustache while seeking a word. These actions, however, were so human that they appealed to the auditors, no matter how hesitant may have been the King of Spain's English.

Other Subjects.—The Movietone also gave to this country a talking picture of Mussolini, an excellent impression of King George's speech at the opening of the new Tyne Bridge and a most interesting flash with sounds and speech of the signing of the Paris Pact in the Salle de l'Horloge.

THEATER EQUIPMENT FOR SOUND

There are in the United States 20,700 of the world's 57,341 motion picture theaters. Less than one thousand of the houses in this country are wired for the reproduction of sound pictures, and even the most optimistic producers do not expect that there will be more than 4,000 thus equipped by the end of this year. France has only three theaters wired for sound and Great Britain has only a few more. Technical experts of the Western Electric and General Electric companies are working slowly on the problem. One reason for this may be that improvements in their respective devices are constantly being discovered. At the time this is written it costs about $17,000 to equip a 3500-seat theater for sound pictures and correspondingly less for smaller houses.

THE SILENT FILM

Production.—The fact that Hollywood is making pictures with sound does not mean that there will be a scarcity of silent features. Most of the audible film stories are also being

made in silent form, for not only are they needed in cinemas in this country, but the producers have to consider the foreign market which comprises anywhere from 25 to 46 per cent of their business.

Russian Titles.—From the point of view of satisfactory entertainment, the silent films are still far ahead of anything that has been produced with dialogue. In the course of the year there were some splendid examples of really artistic cinematic work. Among the better films were two Russian productions, one called "The End of St. Petersburg," and dealing with the fall of the Russian capital, and another telling of Czar Ivan and entitled, "Ivan the Terrible."

"The Last Laugh."—The Hollywood productions, some of which were equipped with sound effects that did not enhance their story values, evidenced remarkable strides in shadow story-telling. The perambulating camera, used by F. W. Murnau in his picture, "The Last Laugh," by means of which characters may be picked out or followed to widen the scope of the scenes without increasing the size of the screen. This is done by putting the camera on wheels and propelling it in the desired direction.

Jannings Pictures.—Two of the outstanding film features made in California were "The Last Command" and "The Patriot," in both of which Emil Jannings was the leading player.

Chaplin.—It was a year in which Chaplin presented one of his delightfully imaginative comedies. This particular example was called "The Circus."

Other Features.—"White Shadows in the South Seas," the exterior scenes of which were made in Tahiti, was a fine feature. The Germans delivered a strong picture in "Homecoming," and Mr. Murnau did a circus drama called "The Four Devils." Frank Borzage, producer of "Seventh Heaven," contributed a finely acted and brilliantly directed film in "Street Angel." King Vidor issued "The Crowd," a well-sketched drama with an undecided ending. He also was responsible for a peculiarly clever satire on Hollywood life, heralded as "Show People." While these films were the chief pictorial offerings, there were a score of others that merited attention, especially a German one-reel picture known as "Killing the Killer," which reveals a battle to the death between a mongoose and a hooded cobra. This film has been on view in a number of the small theaters in and around New York, but it has not been exhibited in the large houses. The reason for this is that the producers believe that women dislike snakes on the screen. Since the presentation of this short film, however, it is believed that this objection was overcome by the fact that the snake was eventually killed by the mongoose.

British Pictures.—Great Britain contributed three war pictures during the year. The first was "The Battles of Coronel and Falkland Islands"; the second, an exceptionally clever sea study of mystery ships, known as "Q Ships," and the third, a pictorial account of the British military activities in 1916, called "The Somme."

COGNATE SOCIETIES

GENERAL

AMERICAN ACADEMY IN ROME.—101 Park Ave., New York, N. Y.

AMERICAN CERAMIC SOCIETY.—Lord Hall, Ohio State University, Columbus, O.

AMERICAN FEDERATION OF ARTS.—1741 New York Ave., Washington, D. C.

AMERICAN FINE ARTS SOCIETY.—215 W. 57th St., New York, N. Y.

AMERICAN INSTITUTE OF ARCHITECTS.—101 Park Ave., New York, N. Y.

AMERICAN NUMISMATIC SOCIETY.—156th St. and Broadway, New York, N. Y.

AMERICAN SCENIC AND HISTORIC PRESERVATION SOCIETY.—154 Nassau St., New York, N. Y.

AMERICAN WATER COLOR SOCIETY.—215 W. 57th St., New York, N. Y.

ARCHÆOLOGICAL INSTITUTE OF AMER-

ica.—New York University, New York, N. Y.

Architectural League of New York.—215 W. 57th St., New York, N. Y.

Art Alliance of America.—65 E. 56th St., New York, N. Y.

Art Center, Inc.—65 E. 56th St., New York, N. Y.

Art Students' League of New York.—215 W. 57th St., New York, N. Y.

Artists' Guild.—2 E. 23rd St., New York, N. Y.

Fine Arts Federation of New York.—215 W. 57th St., New York, N. Y.

Graphic Arts Board of Trade.—291 Broadway, New York, N. Y.

Guild of Free Lance Artists.—22 E. 17th St., New York, N. Y.

Independent Artists' Society.—1947 Broadway, New York, N. Y.

Metropolitan Art Association.—489 Park Ave., New York, N. Y.

Municipal Art Society of New York.—119 E. 19th St., New York, N. Y.

National Academy of Design.—175 W. 109th St., New York, N. Y.

National Sculpture Society.—215 W. 57th St., New York, N. Y.

New York Society of Architects.—29 W. 39th St., New York, N. Y.

New York Society of Craftsmen.—65 E. 56th St., New York, N. Y.

Numismatic Society of America.—156th St. & Broadway, New York, N. Y.

School Art League.—599 Fifth Ave., New York, N. Y.

School Garden Association of New York.—121 E. 51st St., New York, N. Y.

Society of Arts and Crafts.—7 W. 56th St., New York, N. Y.

Society of Beaux Arts Architects.—126 E. 75th St., New York, N. Y.

Society of Illustrators.—Art Center Building, New York, N. Y.

Society of Independent Artists, Inc.—1947 Broadway, New York, N. Y.

DRAMA

Actors' Equity Association.—45 W. 47th St., New York, N. Y.

Actors' Fidelity League.—17 E. 45th St., New York, N. Y.

Actors' International Association.—701 Seventh Ave., New York, N. Y.

American Dramatists.—2 E. 23rd St., New York, N. Y.

American Dramatists' and Composers' Society.—2 E. 23rd St., New York, N. Y.

Drama League of America.—59 E. Van Buren St., Chicago, Ill.

English Folk Dance Society.—159 E. 33rd St., New York, N. Y.

Episcopal Actors' Guild.—1 E. 29th St., New York, N. Y.

International Theatrical Association.—1540 Broadway, New York, N. Y.

Motion Picture Directors' Association.—234 W. 55th St., New York, N. Y.

Motion Picture Producers and Distributors of America, Inc.—469 Fifth Ave., New York, N. Y.

Motion Picture Theatre Owners of America.—25 W. 43rd St., New York, N. Y.

National Association of the Motion Picture Industry.—Times Bldg., New York, N. Y.

National Board of Review of Motion Pictures.—70 Fifth Ave., New York, N. Y.

Photoplay League of America.—221 W. 57th St., New York, N. Y.

Theater Guild, Inc.—243 W. 52nd St., New York, N. Y.

MUSIC

American Guild of Organists.—29 Vesey St., New York, N. Y.

Cantors' Association of America.—40 Second Ave., New York, N. Y.

Chorus Equity Association of America.—110 W. 47th St., New York, N. Y.

Grand Opera Society of New York.—939 Eighth Ave., New York, N. Y.

Jewish Federation for Music and Drama, Inc.—5 Beekman St., New York, N. Y.

League of Composers, Inc.—29 W. 47th St., New York, N. Y.

MacDowell Endowment Fund Association.—1 E. 57th St., New York, N. Y.

Musical Alliance of the United States, Inc.—501 Fifth Ave., New York, N. Y.

National Bureau for the Advance-

MENT OF MUSIC.—45 W. 45th St., New York, N. Y.

NATIONAL MUSIC LEAGUE.—105 W. 57th St., New York, N. Y.

NATIONAL PATRIOTIC SONG COMMITTEE.—62 Washington Square South, New York, N. Y.

NEW YORK COMMUNITY CHORUS.—5 Columbus Circle, New York, N. Y.

ORATORIO SOCIETY OF NEW YORK.—111 W. 57th St., New York, N. Y.

OPERA AND DRAMA SOCIETY.—203 W. 54th St., New York, N. Y.

PEOPLE'S CHORUS OF NEW YORK.—41 E. 42nd St., New York, N. Y.

PHILHARMONIC SOCIETY OF NEW YORK.—113 W. 57th St., New York, N. Y.

RUSSIAN BALALAIKA ORCHESTRA ASSOCIATION.—1493 Broadway, New York, N. Y.

SUNDAY SYMPHONIC SOCIETY.—1620 Broadway, New York, N. Y.

SYMPHONY SOCIETY OF NEW YORK.—33 W. 42nd St., New York, N. Y.

DIVISION XXVII
EDUCATION

ELEMENTARY EDUCATION

By James F. Hosic

Professor, Teachers College, Columbia University

The term Elementary Education has taken on a varied meaning. Its most common application is still to the work carried on in a common school of eight grades, which children enter about the age of six. In such a use there is, however, some uncertainty unless the context supply the deficiency, whether the reference is to rural schools or city schools. Most frequently the reference is to the latter.

SCHOOL PROGRESS

Supervision.—The distinction is, however, rapidly becoming less marked. In some sections the familiar one room country school has nearly or quite disappeared. In its place have appeared "consolidated" or central schools of from three to twelve rooms or even more. There is, however, no uniformity of practice as to the supervision of schools of such size. Some small schools are under city boards of education and some fairly large schools remain under the direction of a county superintendent and the state education office. The time is near at hand when the control of all schools for children below the age of twelve in many states will be unified. Distinct progress in this direction has been made in the state of New York and elsewhere during the past year.

Range of Schooling.—There is a well-defined movement looking to change in the range of elementary schooling. At the upper extreme, the intermediate or junior high school is absorbing grades seven and eight of the traditional organization. At the other extreme, the kindergarten now generally adds at least a year for the children from five to six years of age. A further extension also seems to be in progress through the organization of "nursery" schools, first founded in England and as yet in the experimental stage. These schools receive children as early as the eighteenth month and care for them till the kindergarten age is reached. Ultimately these pre-school units will doubtless merge with the existing kindergartens so as to provide primary schools for children up to the age of eight.

The nursery school is not to be confused with the day-nursery. It is at present generally connected with a college or university and serves more or less as a laboratory for the study of nutrition, mental growth, and training of young children and a demonstration for parents. Several new centers for such study have been established in different parts of the country recently. The equipment of the specialists and teachers in these units is far more adequate than is now generally possessed by kindergarten and primary teachers and supervisors, and hence sets a high standard of professional service for workers with younger children.

SCHOOLING PLANS

Dalton and Winnetka Plans.—Several new proposals have been made for the reorganization of the elementary school and the arrangement of its program. The Dalton Plan, devised by Miss Helen Parkhurst, has met with

more acceptance in England than in the United States. Somewhat more popular is the so-called Winnetka Plan which, like the Dalton Plan, is an attempt to give freer play to the individual pupil. The task of preparing materials adapted to individual instruction is difficult and hence progress in the application of these ideas must necessarily be slow.

The Platoon Plan.—The Platoon, or Work-Study-Play School, is multiplying rapidly. One or more such schools is to be found in each of over two hundred cities. The essential feature of this plan is the division of the school into two parts which have an alternating daily program. Large use is made of "special" rooms and of the playground, and the advocates of the scheme claim both economy in the use of the school plant and a better curriculum. A national organization, with a monthly magazine, has been formed to exploit this type of elementary school.

Cooperative-Group Plan.—The latest proposal is in the form of a working hypothesis upon which is to be based a cooperative-group plan of organization. According to this proposal, the work of certain groups of pupils—five classes more or less—is to be placed in the hands of a cooperating group of teachers in charge of a chairman, or group leader. Each teacher becomes responsible for instruction in related subjects,—say, arts and crafts or social studies—and teaches in a room specially equipped for the activities she is to direct. Grade lines are somewhat obscured, the pupil remaining the required number of years in a certain stage or cycle and then passing on to the next. While in a given cycle, he works sometimes with one group, sometimes with another, and sometimes alone.

Certain schools have experimented with this new type of organization during the past year with great satisfaction. Teachers profess to be greatly relieved in being permitted to concentrate on a few subjects instead of trying to cover twelve or more. They also greatly appreciate having library equipment for library work and laboratory equipment for laboratory work. The principals react favorably to the greater flexibility that the plan secures as contrasted with the traditional plan of assigning a class exclusively to one teacher, or with the Platoon Plan, in which the staff is divided into "home-room" teachers and specialists.

CLASSIFICATION OF PUPILS

Intelligence Grouping.—For some years, the division of the pupils of an elementary school into "homogeneous" groups has been growing in favor. This consists of placing pupils of approximately the same intellectual ability in the same classes. Such classes are familiarly known as X, Y, or Z classes, according to whether bright or fast-moving, average, or dull pupils are meant. Selection of pupils for these classes has been based largely upon general tests of intelligence, administered either to large groups or to individuals.

Achievement Tests.—The progress of pupils so classified has in turn been measured largely by means of achievement tests,—tests made up from specific school subjects such as spelling and arithmetic. This practice has now been challenged by Professor Kelley, of Stanford University, who finds that more than 90 per cent of the contents of these two kinds of tests is common. Since this is so, it is clear that they measure very much the same abilities, and hence conclusions based upon scores obtained by the use of them cannot be treated so as to discover the relation of ability to actual performance. This finding is apparently destined to modify to a marked degree current practice in classification.

Training Limitations.—Still more far-reaching in its effects will be the outcome of an extensive investigation of the limitations of training carried on by the National Society for the Study of Education. Carefully controlled experiments were devised to determine, if possible, the relative influence of nature and nurture upon a child's success in learning. The data obtained were interpreted so variously by the specialists in charge of the investigation that no very positive con-

clusion seems justified. One thing is clear:—we do not now have instruments adequate for measuring native or inborn intelligence, if indeed this term best describes any powers or capacities a child is found to have. What is now referred to as intelligence is certainly the result, at least in part, of experience. Hence an unvarying ratio between age and mentality is probably non-existent. Prediction of future performance on the basis of general tests is, therefore, doubtful, except within very wide limits, and the segregation of pupils by means of such tests is doubtful practice. If this position should be borne out by subsequent investigation, the report of the National Society will appear to have been of first-rate importance.

ELEMENTARY SCHOOL PRINCIPALS

Limitations of the Principal.—Turning to other phases of elementary education, we find another report of a quite different character almost equally worthy of notice. This is the work of a committee of the National Association of Elementary School Principals and relates to the present status of that office and recommendations for improvement. Principals of elementary schools, it appears, have frequently little or no specific training for managing a school, except such as may be acquired by teaching in one. Even the level of attainment in general college education is low, graduation being the exception rather than the rule.

Remedial Movement.—The more progressive principals have been keenly aware of this state of affairs for some time and through state and national organizations are now earnestly seeking a remedy. In view of the obvious importance of the principal in determining the character and effectiveness of a school, no movement towards a better opportunity for children more deserves success and encouragement.

National Association Report.—The report on the *Elementary School Principalship* fills a volume of about six hundred pages. It is made up largely of the findings of careful investigation, and its recommendations are made by a representative group of principals and professors of education who devoted some three years to gathering and preparing the material of the report. These findings will doubtless be made the bases of important changes in state legislation and in the policies of boards of education, looking to the placing of the elementary school principalship on a plane comparable to engineering.

SCHOOL SUPERVISORS

Steps were taken in the past year also to render the work of school supervisors more efficient. These consisted in the forming of a national association of supervisors and the issuance of a year book on supervision. This volume covers a fairly wide range of topics but reflects a remarkable unanimity of point of view. Supervision is regarded as a coöperative activity which should be carried on in the light of scientific knowledge. Supervisors are supposed to assist teachers in their work for and with children.

AIMS OF ELEMENTARY EDUCATION

This review may well conclude with reference to recent attempts to redefine the purpose of the elementary school and to set forth its proper program. The Progressive Education Association, through its president, Stanwood Cobb, sums up the principles and aims of elementary education in a popular volume called *The New Leaven*. By means of a questionnaire directed to the members of the society, most of whom are connected with private schools, Mr. Cobb obtained a consensus of opinion, which he presents in a series of brief propositions as follows: (1) health must come first; (2) learning comes from doing: let the hands aid the brain; (3) the classroom should be freed from unnatural restraints and exterior compulsions transformed into interior compulsions; (4) adapt education to the differences of the individual child; (5) group-consciousness and social-mindedness should be developed in children: social adjustment and character training are as im-

portant as academic progress; (6) the child should have abundant opportunity for creative expression; (7) enable the child to acquire thorough control of the tools of learning rather than merely to acquire facts; (8) introduce into academic work the method of creative expression, so that education shall be joyous; (9) abolish the tyranny of marks and examinations; (10) the teacher should be a leader and guide, not a taskmaster.

SECONDARY EDUCATION

By Philip W. L. Cox

Professor, New York University

ADJUSTMENTS

Enrollment.—In secondary education in the United States, during the past year, there has apparently been undertaken at last a thoroughgoing readjustment. The curriculum, administration and organization are responding to the inescapable demands which increased enrolments have been putting on the public junior and senior high schools and the first two college years.

Even though the *rate* of growth of enrollment of adolescents in junior high schools, senior high schools and colleges has decreased somewhat since 1922, the rate is still rapid and the number of pupils will surely continue to increase for a decade to come unless social and economic factors change markedly. This increase seems, in New York City at least, to be causing a slight decrease in the enrolments of continuation schools. The great cost of new buildings and operating expenses, which has occasionally aroused sharp criticism in the past, is apparently being accepted by tax payers with less public opposition than formerly.

JUNIOR INSTITUTIONS

Extension of the Movement.—While no data are available for the period since 1926 (when 3526 "reorganized" high schools containing junior high schools of some sort were reported), there can be little doubt but that the rate of increase of new units and enrolments has been even more rapid since that time than before it. Seventy-four per cent of the sixty-eight cities whose population in 1926 was over 100,000 had already established junior high schools, and sixty-one per cent of the 180 cities whose population was between 30,000 and 100,000 had also done so.

Other cities were, at that time, committed to, or were favorably considering the reorganization of their secondary schools.

High Schools.—During the year, successful junior high school conferences have been held at many points in the country; among them are New York University, Temple University, Bridgewater (Mass.) Normal School, Bucknell University, Washington University, University of Kansas, Arkansas State Department of Education, University of Pennsylvania, and the New Jersey Junior High School Teachers' Association. The Junior High School Clearing House has been revived by S. O. Rorem of Lancaster, Pa., and is giving expression to the vigorous pioneers in this field. Local school systems, of which St. Louis, Mo., Elizabeth, N. J., and Winfield, Kansas, are examples, have published valuable reports of their junior high school organizations.

Vocational Schools.—In the early days of the junior high schools, several of them provided definitely for vocational preparation for occupations which children of 14 to 16 years of age were known to enter. Partly because of legislative and economic changes, and partly because of adverse criticism, the function of vocational preparation has not often been included in junior high schools which have developed since 1918. New York City, however, is now organizing Junior Vocational Schools for children of the sixth, seventh, and

eighth grades. A realistic response is thereby being made to the needs of many children who will not continue in full-time schools very long after the law permits them to go to work.

Colleges.—Only less remarkable than the growth of the junior high schools, are the current developments in the junior college field—particularly of public junior colleges. From 1922 to 1927, the number of junior colleges of all types increased from 207 units with 16,121 students to 325 units with 36,630 students. Among public junior colleges, the rates of increase of units and of students were over twice as rapid. Eighteen of these units were open for the first time in 1927-28; doubtless at least as many more have developed since that time.

CURRICULUM

Practices.—Throughout secondary education, there is taking place a marked modification in curriculum practices. Not only are curricula diversified in general scope and aim, but they are also being adjusted to ability groups. The more able pupils are encouraged to undertake more courses than the less able ones, and they are expected to do work of much more independent and scholarly character. Whether such pupils elect an academic, a commercial, or a technical curriculum, much more work in both quantity and quality is required of them than of the average and less than average pupils.

At the same time there is a marked tendency to amalgamate the social science courses which have in the past occupied separate places in the various curricula; some commercial specialists are protesting against this merger. On the other hand, advanced courses in science, art, music, and industrial arts show a distinct trend toward further diversification to accord with curriculum purposes.

Requirements.—Practices in the academic college preparatory curricula lag far behind the rest of the educational program of the high school. High school faculties are hampered not by actual requirements but by fear and ignorance. With four minor exceptions, no college demands four units of Latin for admittance; many high schools continue to prescribe and most schools urge pupils, preparing for college, to take four years of Latin. Nevertheless, a great many of the graduates of other curricula do actually enter colleges each year.

Diversification.—Promising beginnings are being made in vitalizing and humanizing many subjects of the curriculum. Extensive reading in literature, history, science and foreign languages is rapidly replacing the more intensive study of selected texts. While this practice has been urged and to some extent used heretofore, experimental evidence of its superiority has not been available until this year. Creative education through self-expression in poetry and prose, in art and music, and in rhythm and drama, which was distinctly an innovation a few years ago, has become an almost universal aspect of progressive secondary schools.

Radio and Aeronautics.—For some years the radio has been used in connection with assembly exercises and music classes. Great impetus has been given this innovation by the Damrosch lecture-concerts which began this year.

Aeronautical education is rapidly finding its place in the curriculum of progressive secondary schools. Encouragement is given to the innovation by the Daniel A. Guggenheim Foundation which has a country-wide advisory committee of educators of which Dean John W. Withers of New York University School of Education is Chairman.

EMOTIONAL ASPECTS OF SECONDARY EDUCATION

Mental Hygiene.—Most significant of all developments of the year, perhaps, is the acceleration given to the effort to administer the school with due regard for the feeling aspects of human life. This new emphasis on mental hygiene is seen in the appointment of psychiatrists, psychologists, visiting teachers, deans, vocational counselors, and grade advisers for

high schools. Even more fundamental, though less concrete perhaps, are the new attitudes toward failing pupils, toward disciplinary cases, toward eligibility for athletics and student activities.

Student Activities.—The curriculum is rapidly absorbing the extra-curriculum, and is being enriched by the spontaneity and enthusiasms typical of the latter. In the creatively controlled high school, student activities are important instruments of education; they are not treated as mere rewards for lesson learning and good behavior. Less and less are pupils and teachers being controlled by the authority of the principal; more and more are faculties, student bodies and parents encouraged to cooperate with the administrators to initiate and conduct experiments for the improvement of the schools.

Selection and Rejection.—Less and less is heard of the high school as an instrument of selection and rejection on the basis of scholarly interests and abstract verbal intelligence. Something of the conception of the Danish Folk High school, which accepts all who desire to enter, "enlivens" them, and then encourages them to educate themselves, is finding its counterpart in the modern American secondary schools.

CRITICISMS

Some criticism there is, of course. Following the adverse criticisms of Flexner, formerly of the General Education Board and the re-publication of Learned's unfavorable comparison of American secondary education with a glorified interpretation of European schools, President Lowell of Harvard launched a sharp attack at the meeting of the Department of Superintendents. On the other side, Judd of Chicago and "School Life," published by the Bureau of Education have defended American education.

In this connection there should be noted: (1) the publication of the Modern Language Survey, which indicates that the teaching of French in American high schools is superior in some respects to that of Canada and England; (2) the coöperative study of American and English secondary education undertaken by Professors Jones and Grizzell of the University of Pennsylvania School of Education; (3) the general test of academic achievements given under the direction of the Carnegie Foundation for the Advancement of Teaching to 40,000 high school seniors in Pennsylvania high schools and to college students in the same state, the preliminary reports on which seem to justify, perhaps, the general curriculum elections; and (4) the very favorable report on the New York City high schools by Herr Silbermann, a Berlin educator.

Two other features of more than passing importance have been the publication of the Sixth Yearbook of the Department of Superintendence of the National Education Association, which deals with the High School curriculum with emphasis on the actual needs and characteristics of adolescent Americans, and the transformation of the independent National Association of Secondary School Principals into the Department of Secondary School Principals of the National Education Association. This amalgamation is symptomatic of the recognition of the fact that at last the high school is truly a common school, the crowning glory of free public education.

COLLEGIATE EDUCATION

By Theodore A. Distler

Director on Admissions and Personnel, New York University

INTERNAL PROBLEMS

Enrollment.—The period of experimentation and self-analysis which reached great heights in 1927 continued in 1928. The colleges have had some opportunity to cope with the

increased registration and they are now turning their experimenters and analyists toward the solution of internal problems, many of which, of course, are the result of this increased enrollment. Some significant facts were brought out recently by Dean Walters in regard to student enrollment in the colleges and universities. According to Dean Walter's figures gleaned from questionnaires from 216 colleges, the increase in registration for the reporting colleges is but two per cent. This, according to his interpretation, is the beginning of a slow decline which will eventually bring college enrollments to stationary periods. Some of the reasons for this decline are as follows: (1) the agricultural and industrial situations; (2) the development of the Junior College; (3) the deliberate limitation of enrollment; (4) restricted immigration.

Internal Criticism.—The pressure brought by the terrific influx of new students in the last decade has lessened sufficiently to permit the colleges to continue, in a more leisurely and thorough-going manner, internal experiments which were heretofore arrested by this rush of students. During 1927 the great number of articles in magazines and newspapers proved that there was a tremendous interest in college problems. Inasmuch as many of these articles were by men outside the college walls, the group might be referred to as looking in at the colleges from without. The present year has brought us many articles on colleges, but more important, it has brought us many books, and in practically all cases these books were written by men from within. The emphasis this year seems to have been on internal criticism.

Curriculum adjustment goes on. There is everywhere the attempt to relate courses to life. The movement toward individualization, simplification, socialization, and liberalization continues. The colleges are attempting to individualize themselves and we are having an increased number of colleges which are stating their purposes in their catalogues. Dean Hawkes of Columbia has this year suggested that his curriculum should meet the needs of three essential types of students. The colleges are interested at the present not only in giving general courses to orient freshmen, but are also interested in giving senior courses which shall coordinate the ideas gained throughout their four years in college.

THE FACULTY

Grouping of Functions.—More than a little attention is being directed toward the functionalization of the duties of the faculty. There is a noticeable drift toward the separation of the functions of a university faculty into three distinct groups.

Teaching as a Pure Function.—The teaching faculty has the emphasis placed on teaching as a pure function. It is now not only essential for a teacher in the Liberal Arts college to know his subject; he must also be able to teach it. The entire November bulletin of the Association of American Colleges is devoted to a discussion of the teaching problems in American Colleges. Dr. Kelly regards this movement as the present-day renaissance. There is a growing belief on all sides that good teaching is of primary importance, especially in an undergraduate college. Older agencies of the teaching processes,—the laboratory, the lecture, the recitation, the quiz and the examination,—are being replaced and modified by the project method, the round table, the advisor, the tutor, the preceptor, the conference, the colloquium, and the comprehensive examination. There is an increased feeling that promotion of the faculty, which in many cases is now based on research alone, should come as a reward for effective teaching.

The administrative faculty has the emphasis placed on administration as a pure function. There is the realization that the administrator needs a specialized training just as much as the teacher and the research worker. The educational situation which results from making a poor administrator of a good professor or of a good research man is fast being eliminated. Some of the large univer-

sities; namely, the University of Chicago, Columbia University, University of Minnesota, Ohio State and New York University, have installed courses and are training men for college administrative positions. The future college president, deans, deans of men, personnel workers, registrars, counselors of studies, will be drawn by and large from individuals who have specialized in administrative work.

The research faculty has the emphasis placed on research as a pure function. Universities are making great strides in this direction. Some are permitting professors to devote all their attention to research with only seminar courses of graduate students. Some universities are inviting research workers to use their laboratories without cost. The research professor is coming to be known for his true worth.

Importance of Specialized Training.—Occasionally there is found in the colleges a man who can fulfill two of the above-mentioned functions and in rarer instances an individual who might possibly fulfill the entire three fairly well; but, in general, with the increasing complications of college life, the colleges are coming to realize that they should require a specialized training, and that in the future they must of necessity choose men of specialized training for these three fields.

CURRICULUM AND EQUIPMENT

Libraries.—The newer conceptions of the colleges as places primarily for study are having their effect on both the curriculum and the physical equipment. The libraries are being studied internally as well as externally. The present demands are for books as well as buildings. The libraries are fast becoming as effective in the college work as the scientific laboratories.

Student Residence Grouping.—There is an increased disposition, which probably is influenced by the English system, to concentrate the residences of groups of students with the idea of creating a scholarly atmosphere. Chicago University is spending millions on this idea: Wisconsin has done it in a small way with the Meiklejohn plan. E. S. Harkness gave $13,000,000 to Harvard University for dormitories where students will live, eat, and study under the tutorial plan. At Princeton there is the same plan on the graduate level. If systems of this type increase, it will be but a matter of time before fraternities will not be resident centers but will function solely as social organizations.

Religion and Chapels.—The realization that religion has a very real place in the college curriculum as well as the college life is apparent by the new movements in this direction. At Chicago the Rockefeller gift is an example of the physical symbol of religion. At Princeton the appointment of a Dean of Religion is an example of another type of interest. At Columbia the courses in religion are examples of still another type of development. The idea of making religion an integral part of the entire life of the student body through the erection of beautiful chapels, the institution of courses in the curriculum, and the appointment of religious advisors, whether they be chaplains or deans of religion, is but the first step in the vitalizing of religion in the colleges. The movement is gaining impetus and the coming years will see more chapels, larger numbers of courses, and more deans of religion.

COLLEGE AND UNIVERSITY DEVELOPMENT

Student Responsibility.—The undergraduates in the colleges are increasingly accepting the serious responsibility of students. They are discussing with the administrators and faculty the policies of the colleges in which they are enrolled. They are striving to become active participants in the development of the colleges. Their student conferences are devoted to discussions of serious matters. We have significant evidence of this increased interest. In the last five years there have been student surveys which have included all phases of college life including the administration and teaching functions at the

following institutions: Purdue, University of California, University of Oregon, Bowdoin, Wesleyan, Dartmouth, Harvard, and Northwestern Universities.

Broadening Scope of Work.—The general broadening of the scope of the work of large universities strikes a new note in American education. This is exemplified by Columbia with the addition of the Seth Low Junior College and St. Stephens College (a four-year college), the University of Pittsburgh with its development of Junior colleges, and New York University with its development of institute centers. These are the beginnings of interesting movements on the part of urban universities. We have also the movements of Johns Hopkins, Chicago, and Leland Stanford to become practically upper colleges and graduate schools.

Financial Problems and Gifts.—Most of the colleges are still confronted with serious financial problems. This situation is especially true in women's colleges. So acute is this problem that seven of the most prominent women's colleges; namely, Barnard, Bryn Mawr, Mount Holyoke, Radcliffe, Smith, Vassar and Wellesley, are planning to campaign jointly to make their critical situation known to people of means. There have been, it is true, many large gifts to institutions, notably A. P. Whitney's bequest of $18,623,176 for the New York Hospital and Cornell Medical School Center, and Mr. Harkness's $13,000,000 to Harvard. Mr. Rockefeller, too, has been generous, but with some emphasis on foreign gifts. Charles Hall's bequest of $10,000,000 for higher education in the Near East is a typical example of what is happening in some directions. It is an interesting commentary on American generosity to note that those institutions which are already known as wealthy are receiving the major portion of the gifts, whereas others, which might be doing just as effective a job, are overlooked.

EDUCATION FOR THE PROFESSIONS

By Ambrose L. Suhrie

Professor, New York University

The callings which may properly be included in a comprehensive list of the professions are many and the number is steadily and rapidly increasing. It is possible here to present but a brief report of the significant developments of the year in but a few of the principal types of professional education.[1]

LEGAL EDUCATION

Law Schools.—The Carnegie Foundation for the Advancement of Teaching, as part of a continuing study of legal education, published in September, 1928, a comprehensive volume entitled *Present-Day Law Schools in the United States and Canada.* From this it appears that there were, in 1927-28, a total of 176 degree-conferring law schools in the United States proper (excluding outlying possessions), of which 77 were "full-time" and 79 "part-time." The remaining 20 institutions were of the "mixed" type; *i.e.*, in addition to work intended for those who devote their entire time to their studies, these schools maintained one or more independent divisions having a schedule of classroom hours convenient for self-supporting students. The aggregate attendance at "full-time" schools in the autumn of 1927 (the latest date for which figures are available) was 14,779, a loss of 127 from the year before; at part-time schools 17,268, a gain of 1,518; at "mixed"

[1] The author is indebted for significant contributions to the materials presented in the several sections of this article to the following persons: on Legal Education—Alfred Z. Reed; on Medical Education—Walter Niles; on Theological Education—William J. Thompson, Francis A. Garney; on Engineering Education—H. P. Hammond; on Education for Business—Paul S. Lomax.

schools, 14,610, a loss of 95; total for all schools, 46,657, a net gain of 1,296.

Standards and Restrictions.—Of the full-time schools, 54 (70 per cent) are members of the Association of American Law Schools, and these, with 5 others (making 77 per cent), have been approved by the Council on Legal Education as complying with the standards of the American Bar Association. On the other hand, although part-time work is not in terms condemned by either Association, their standards are of such a nature that no exclusively part-time school, and only 6 of the "mixed" type, actually qualify. The standards of the two Associations are now virtually identical, the principal distinction being that schools are not eligible for membership in the Association of American Law Schools until they have complied with the requirements for at least two years. The standard that is currently receiving the greatest attention is that requiring two years of college work for admission into the law school as a regular student. Recently, both Associations have not only redefined this requirement, but have strengthened their rules concerning admission of special students, not candidates for a degree. Such students must not exceed ten per cent of the entering class; even under this restriction of numbers, they may be admitted only if they give evidence of special promise; and (in the case of the Association of American Law Schools) they must be at least twenty-three years of age.

Admission to the Bar.—Requirements for admission to the bar, although slowly rising, are still prevailingly low in the above as in other respects. Fourteen states do not require applicants to produce any specific evidence of general education. Only five—Colorado, Illinois, Kansas, New York, and Ohio—insist, or have announced that they shortly will insist, that all applicants complete two years of college work before beginning the study of law, and even here the rule is weakened by recognition of "equivalents" for residential college work. Of all the state rules, Pennsylvania's recently established requirement of a stiff College Entrance Board examination is, in its practical operation, the most rigorous.

Study and Research.—Outside of professional training, the American Law Institute, in collaboration with law school teachers, is continuing its work of restating branches of the common law and of preparing a model Code of Criminal Procedure. During the year, Johns Hopkins University established an "Institute for the Study of Law," which it hopes to develop into a school dedicated primarily to training research scholars rather than practicing lawyers.

MEDICAL EDUCATION

Liberalizing Curricula. — While there were no revolutionary changes in medical education in 1928, there was steady progress in liberalizing curricula and methods of teaching. The necessity for raising the standards of education in medicine which became apparent in the early years of the present century, and which resulted in the elimination of over half the medical schools existing in 1900, required the adoption of certain schedules of instruction which permitted but little variation. These standards were prescribed by the Association of American Medical Colleges and the Council on Medical Education of the American Medical Association and were generally adopted and maintained by the various states through the Departments of Education which regulate licensure for practice. This movement, essential at the time, resulted in the adoption by all American medical colleges of courses of instruction, too rigid in their application for the best training of scientific physicians.

Experiments in New Standards.—All of the weaker schools having been eliminated, the necessity no longer exists and the Association of American Medical Colleges has therefore recently encouraged experiments which deviate from the former standards. The School of Medicine of Yale University and the Johns Hopkins Uni-

versity School of Medicine have already undertaken such experiments and the School of Medicine of Duke University proposes also to organize its curriculum on a new basis. Most of the other schools have made changes in the methods of teaching and the results which will not be apparent for several years are awaited with great interest by medical educators. The Departments of Education of many of the states are cooperating in the movement. Such a change of attitude on their part is highly significant, as it permits the development of medical education in harmony with modern pedagogy.

The Committee on Medical Education under the leadership of President Lowell of Harvard has continued to survey medical education in the United States and has issued its third annual report. It is anticipated that this comprehensive study will result in the formulation of principles upon which further progress may be founded.

Columbia Medical Center.—During the year the great Medical Center of Columbia University and the Presbyterian Hospital, in association with several special hospitals, has been opened in New York City. It provides unsurpassed opportunities for medical teaching and research and emphasizes the fact that all medical instruction should be of the university type and that the best results can be attained only through close association between the teaching hospitals and the Universities.

New York Hospital-Cornell Medical College Association is another important development of a similar character in New York City. It has acquired considerable land adjacent to the Rockefeller Institute on the East River and plans for a new buildnig to house the Cornell Medical College, as well as the New York Hospital and several special hospitals, are now being prepared. It is expected that they will be ready for occupancy by the fall of 1931. It is intended so to fuse the interests of both institutions that they will in effect operate as one. Dr. G. Canby Robinson, recently Dean of the School of Medicine of Vanderbilt University, has been appointed Director of the Association. The endowments under the control of the Association are very large and it is the intention of the officers to provide the best possible facilities for medical education and research.

EDUCATION FOR THE MINISTRY

The Teaching Ministry.—In Protestant Theological Seminaries increasing attention is being given to the preparation of young men for a *teaching* as distinct from a *preaching* ministry. Theological faculties are considering as never before the problem of how more effectively to reach the large proportion of adolescents and adults to whom preaching seems to have little significance.

Courses in Protestant Seminaries.—Courses in ethical phases of economics and political government, are stressed in Protestant seminaries in order to redeem business and politics from remnants of paganism, and in eugenics to retrieve the Christian family. No fewer than twelve seminaries have recently introduced courses in recreational leadership, to Christianize the leisure which wealth has created. Hebrew and systematic theology as requirements are decreasing while electives in dramatics, Y. M. C. A. director training, poster-making, *et cetera*, are increasing. The lecture method in seminaries is giving place to the discussion method.

Preaching may come from a distance to those who desire it as it does in the radio voice of Dr. S. Parkes Cadman to his 20,000,000 Sunday hearers. It would seem, however, that worship cannot thus come from afar, that it must be local. Both Congregationalists and Disciples have commissions studying this important subject. Seminaries are giving added attention to ecclesiastical architecture, art, music and liturgy, to help men and women realize the Presence. Clap-trap to decoy congregations is being more and more frowned upon by theological faculties who recognize preaching the Gospel, worship in the Spirit and teaching the Way as alone valid.

Movement Towards Union.—A leading seminary in May petitioned its denominational body for church union. Students in increasing numbers are found in theological seminaries other than those of their own communion. This forecasts more *union* theological seminaries with blurred sectarian boundaries, each specializing in religious education, homiletics, missions, the rural pastorate, or graduate work.

Pre-theological courses are in embryo. Three seminary years following the college degree may entitle students to receive their first degree in theology; after serving an "internship" as pastor, the doctorate. This movement is taking form in the West. Educational standards for admission to the ministry are rising. This present year the largest Protestant body made a notable advance in requirements.

Recruiting Candidates for the Ministry.—Effective methods of recruiting strong candidates for the Christian ministry have not yet been developed. Many seminary staff members have, however, begun to make periodic visits to colleges in quiet quest for undergraduates whom nature, nurture and grace have marked for the ministry.

Education of Catholic Priests.—The professional education of priests for the Roman Catholic Church is more highly standardized. Seminaries are divided into major and minor, with a course of approximately six years in each. The minor seminary corresponds to the standard high school with two years of college. Emphasis is laid on the classical course. (Cathedral College, New York, would be an example.) In the major seminary (*e.g.*, St. Joseph's, Dunwoodie) the course is standardized; two years of philosophy and four of theology, the basis of which is the *Summa* of St. Thomas. Kindred subjects, such as Sacred Scripture, Church History, Liturgy, Sciences and Languages, are also included.

Seminaries and Enrollment.—There are 84 major and 98 minor seminaries in the United States. The number of major seminaries has not increased since 1920, but the student enrollment in these major seminaries has increased 35% since that year. It should be here noted that a considerable number of American candidates for the priesthood in the Roman Catholic Church secure the whole or at least a significant part of their theological training in the best European seminaries.

Rabbinical education has not undergone any perceptible change in strictly "orthodox" Judaism. The curriculum and methodology are the same today as they were one thousand years ago. A thorough study of Hebrew theology is all that is required. "Conservative" Judaic pedagogics manifests the influence of modern educational philosophy in the socializing of the curriculum. "Reform" Judaism, in the preparation of its rabbis, has undergone the same metamorphosis that the Protestant theological training displays. Social case work, sociology and economics are common subjects in its curriculum.

ENGINEERING EDUCATION

Student Enrollment.—The enrollment of undergraduate students in Engineering Schools and Colleges has shown no marked change in the past five years though there has been a small and steady gain. The number of freshmen and sophomores has been affected somewhat by the growth of the Junior College movement and the introduction of the University College Plan in a few institutions. The number of students entering Engineering Colleges from other collegiate institutions shows a perceptible gain. The most significant trend in Engineering Schools is the gain in the number of graduate students, from approximately 1,000 in 1923-24 to approximately 1,600 in the year 1928-29, a gain of approximately 60% in five years.

The University College Plan as exemplified by the University of Michigan and in a modified form at the University of Pennsylvania has grown and has become of importance in engineering education as in other divisions of professional study. The effect of this plan on engineering edu-

cation is problematic but the movement is being watched with interest by those concerned.

Engineering courses are offered by both the separate schools of technology and the schools of engineering of universities. Engineering colleges themselves show no likelihood of adopting this plan though there is a tendency towards its adoption in several of the larger universities. Changes in curricula are in general in the direction of broader courses of study with increasing emphasis upon the fundamental sciences and humanistic subjects. The engineering curriculum seems to be developing in the direction of less technical courses of study. Specialization in graduate work, however, is one of its chief characteristics.

Study of Degree Courses.—During the year the Society for the Promotion of Engineering Education following its comprehensive study of degree courses in engineering has undertaken a study of non-degree courses in engineering throughout the United States and Europe. This study is conducted by means of funds provided by the Carnegie Corporation of New York and certain private individuals and institutions. It is under the general direction of the Society's Board of Investigation and Research and under the immediate supervision of Dr. W. E. Wickenden and R. H. Spahr.

Summer School Sessions.—The Society's Summer School for Teachers instituted in 1927 continued with two sessions, one for teachers of Physics at the Massachusetts Institute of Technology and the other for teachers of Electrical Technology at the University of Pittsburgh. These sessions were attended by more than ninety teachers and the staff work was conducted by approximately fifty individuals drawn from the teaching staffs of colleges and from industrial establishments. The sessions were of three weeks' duration and were devoted to the study and discussion of the problems and methods of teaching the subjects mentioned. The Session on Electrical Engineering was held in cooperation with the Westinghouse Electric and Manufacturing Company, East Pittsburgh, Pennsylvania, where the members of the school spent approximately one-third of their time studying the work of graduates in the electrical manufacturing industry and the relation between instruction and practice in electrical engineering.

New Engineering Buildings.—During the year a number of notable engineering buildings were completed or begun, including the Packard Engineering Laboratory at Lehigh University and the new Engineering Laboratories at Princeton University. The Guggenheim Aeronautical Laboratory at the Massachusetts Institute of Technology was dedicated during the year.

EDUCATION FOR BUSINESS

Publications.—The year 1928 is noteworthy particularly because it witnessed the efforts of organizations of commercial educators to devote their cooperate endeavors to the production of authoritative literature in business education. The National Commercial Teachers' Federation began in March to issue quarterly *Federation Notes* as the official journal of the Federation in which there is included a résumé of the addresses, discussions, and reviews of the general proceedings of the annual conventions, as well as statements of the plans and policies of the organization.

The Eastern Commercial Teachers' Association published in September its first yearbook, entitled *Foundations of Commercial Education.* This is the first of a series of three yearbooks that are planned by the Association. The 1929 yearbook will deal with *Curriculum-Making in Commercial Education,* and the 1930 yearbook with *Supervision and Administration of Commercial Education. The Journal of Commercial Education* describes the first yearbook as "an achievement of the finest kind in the field of commercial education."

Standards and Requirements.—The National Association of Commercial Teacher-Training Institutions held its first annual convention in connection

with the third annual University of Iowa Research Conference on Commercial Education on March 15, 16, and 17. The main purpose of this Association is to serve as a clearing house for a nation-wide research study of important problems of commercial teacher-training, and for the guidance of an increasing number of leading colleges and universities that provide definite curricula for undergraduate and graduate work in commercial education. The various state departments of education are tending to require the same educational preparation of commercial teachers in secondary schools as the state departments require of academic teachers. Fifteen states now require four years of normal-school or college grade work above approved high-school graduation, and twenty-seven other states report a definite trend toward that requirement.

High School Research.—An important résumé of research in high-school commercial studies is to be found in chapter xxiii of The Department of Superintendence sixth yearbook, *The Development of the High-School Curriculum*, 1928. In this connection it is significant to observe that the rapid improvement of educational preparation of commercial teachers in this country is resulting in a pronounced effort to reconstruct commercial education upon a sound basis of fact and in keeping with a sound philosophy of education.

State Supervisors.—During the year the State of California has appointed a state supervisor of commercial education. New Jersey and New York are the only other states that have made similar provision.

PROFESSIONAL EDUCATION OF TEACHERS

Teacher-Training Policies.—In almost every section of the United States there is a surplus of licensed teachers, large numbers of them having acquired something less than what is now regarded as satisfactory minimum professional preparation for teaching, supervisory or administrative service for which they have been certificated. In all the large cities there is a considerable surplus of persons who have more than fully met the minimum local requirements of two, three, four or five years of professional preparation for teaching. The inevitable result of this situation is increasingly well-defined policies in teacher-training institutions: (1) of lengthening curricula; (2) of limiting registration; (3) of increasing entrance requirements; (4) of eliminating those students who do not give promise of becoming satisfactory teachers.

New Courses Offered.—In the further expansion of the course offerings of our graduate schools of education the most significant new departures have to do with provisions made, in a score or more of institutions, for the specific and professional training of present and prospective teachers and officers for arts and science colleges, and junior colleges, and for professional schools for teachers (state and city normal schools, and teachers colleges, and state and private university schools, colleges and departments of education).

Buildings and Equipment.—Significant additions have been made to the plants of public teacher-training institutions chiefly by way of more adequate and modern demonstration and training school buildings and equipment.

Achievements and Trends.—The American Association of Teachers Colleges made a significant study during the year of the achievements of the past twenty years in the development of public teacher-training institutions and devoted its entire program at the Boston meeting of the Department of Superintendence in February to reports on the more important trends in the recent "teachers college movement."

Teacher-Training Conferences.—A number of national and regional conferences on teacher-training were held during the year. Among these the following seem to have been especially significant: (1) the National Conference in April at Teachers College, Columbia University, on the occasion of the public installation of Dr. William F. Russell as Dean to

succeed his father, Dr. James E. Russell, now Dean Emeritus; (2) the Third Annual Conference of the Normal School and Teachers College Section of the New York Society for the Experimental Study of Education at the Hotel Pennsylvania in New York in April. The program of this conference dealt with educational guidance in high schools of prospective teachers; selective admission of entrants to normal schools and teachers colleges; the professionalization of the curricula of teacher-training institutions; relative emphasis on preservice and in-service professional education of teachers; and faculty-student cooperative government in teacher-training institutions. This conference was attended by approximately 800 administrative and instructional officers of normal schools, teachers colleges and university schools of education as well as by at least 1,000 students from such institutions.

Broadening of Policies.—There is a clearly defined tendency in all sections of the country to develop statewide as distinct from individual institutional policies and programs for the professional education of teachers. In a number of states directors of teacher-training have been appointed with sufficient authority to coordinate the work of all teacher-training institutions and agencies, public and private within the state.

Study of Articulation of Institutions.—A Department of Superintendence commission on the articulation of the various units in American education under the chairmanship of Supt. Herbert S. Weet of Rochester appointed a sub-committee to study the articulation of teacher-training institutions and agencies. Dr. John W. Withers, Dean of the School of Education of New York University, who served as chairman, has prepared a very significant study which will be printed as a part of the commission's report in time for discussion at the Cleveland meeting of the Department of Superintendence in February, 1929.

VOCATIONAL EDUCATION

By Charles R. Allen

Editor and Educational Consultant, Federal Board for Vocational Education

THE THEORY OF PARALLELISM

Exposition.—Within the last few years a number of writers in the field of education have drawn attention to what has been termed "The Theory of Parallelism." This theory holds that the forms which education takes at any particular stage of development of mankind or during the existence of any particular type of social organization, and the objectives included in the educational program, are primarily determined by that type of organization or by the demands of that type of civilization. In other words, any particular form of society looks to formal education to furnish those things which it believes to be particularly desirable or necessary for its well being. Hence we find in the Spartan educational program objectives aiming at military ability, whereas in Athens we find a very different program of education with objectives largely cultural because the Athenian citizen was essentially an individual of leisure able to devote his time to music, poetry and the fine arts, and the productive work was carried on by slaves. As we come down through the history of mankind we find this theory of parallelism seems to hold.

Application to Present Civilization.—Our present civilization is characterized as no previous civilization has ever been by the extent, spread, and application of technical and scientific knowledge. In fact, it could not exist if it were not for the application of this enormous amount of technical knowledge and skill. More and more,

manual labor is being replaced by the services of the technician; and the stability of present civilization and social organization depends upon the work of that technician. Were it not for the immense development in transportation, for example, it would be impossible for the present large numbers of people to live in such cities as London or New York, as is strikingly illustrated when the transportation system for any reason breaks down.

It must be admitted that the development of vocational education is an attempt to bring a closer parallelism between our present civilization and educational service. Vocational education in its broad sense means any form of education or training, however given or by whom given, which assists an individual to secure knowledge and skill through which he can more effectivley carry on his work. Just as it has been said that the function of general education is to assist an individual to live happily and to deal with social relations in an effective way, so it can be said that vocational education represents the technical side of our present life and represents a recognition of the demand upon practically all individuals in some way to secure and apply technical knowledge and skill in the pursuit of some occupation, for in this country there is no significant purely leisure class. Emphasis is laid upon vocational education in our present educational system in the field of professional training, in the field of engineer training, and, to a considerable extent, in the field of commercial training. Nevertheless the tendency has been to put most of the effort on what may be called the "professional grade of vocational education," along with a growing interest in vocational education below the college age.

THE FUNCTION OF VOCATIONAL EDUCATION

Two Theories.—The question of the function of vocational education has been approached from two distinctly different angles: (1) The function of vocational education is held to be to improve the chances of an individual to make the most of whatever particular assets he may possess in the line of intelligence, aptitudes, and abilities. This may be called the "individualistic" point of view. (2) According to the other approach, the function of vocational education is primarily to act as an efficiency device for society, and hence is not so much directly concerned with the welfare of the individual as with the utilization of the individual for the benefit of society. This may be called the economic approach. Neither point of view necessarily excludes the other, since, in general, the individual best equipped to do what he can do best should also be the best contributing citizen.

Nevertheless, the two varying points of view have led to long and sometimes acrimonious discussion. Those who held the economic motive have been accused of standing for "bread and butter" education and of desiring to cut out all forms of cultural and general education. The economic motive insists that only through the work of those who produce in some capacity or those who serve can the utilization of leisure time for culture and general education become possible. Nowadays these two points of view are becoming merged and the proper place of vocational education in a general educational program is now fairly well realized.

Combination of Theories.—How far should vocational education be combined with other forms of education? Here again two radically different points of view are advanced. The proponents of what is called "a well-rounded educational course" collide with the proponents of "the intensive vocational program." According to the conception of the first, vocational education should be given simultaneously with general education, as in the cosmopolitan high school, and the diploma credits in vocational courses given in high schools. The other point of view holds that vocational education should not begin until the individual has reached his limit as to general and cultural

education. The claim is that the best results will be obtained when vocational education is superimposed upon whatever general and cultural education the individual has been able to secure. This method makes it possible for an individual when he reaches the point where he desires specific vocational education, to follow a program entirely vocational, or "intensive."

Both of these methods are in use in this country. The superimposed intensive vocational program is illustrated by the boy or girl who graduates from high school and then goes to business college to secure training in typing and stenography or by the young man or woman who, after going through the college of liberal arts, enters a professional school. The intensive point of view is employed in evening vocational unit courses for adults, in part-time programs for employed learners, and in certain types of trade schools.

CONVENTIONAL FIELDS OF VOCATIONAL EDUCATION

The principal conventional fields of vocational education are: (1) professional education, (2) agricultural education, (3) trade and industrial education, (4) commercial education, (5) nautical education, and (6) homemaking education. All these fields are represented in this country by numerous educational agencies, both public and private, which are dealing with subdivisions of these general fields. Commercial education, agricultural education, industrial education, and possibly nautical education might be classified as non-professional vocational education, although the term "professional" is very indefinite.

GROUPS SERVED BY VOCATIONAL EDUCATION

Preemployment Students.—In all of the above fields, provision is made essentially for service to three groups. First, the group of young people who are looking forward to employment, but who are unable to give their full time to education, either entirely vocational or partly vocational and partly general and cultural. Such a group may be designated as the preemployment group. The second group consists of employer learners; that is, individuals who have already entered into employment, but with the status of a learner, such as, for example, the ordinary case of an apprentice in the trades. The third group are employed adults who are giving their chief time to employment, and who give a portion of their leisure time to education through evening courses or through the utilization of other educational agencies, such as the public libraries, the moving picture theater, the newspapers, magazines, professional literature, etc.

The traditional idea that youth and childhood was the particular time to be devoted to education has led to a provision for vocational education on a preemployment basis. In the great majority of states where vocational education is provided under the terms of the National Vocational Education Act, or through other agencies, attention has been very largely concentrated upon schools or vocational courses whose essential purpose was to serve young people who have not yet entered into employment.

Employed Learners.—The employed learner is employed, but at the same time he has the status of a learner. This particular situation is probably true in the case of trade education, because there only has some form of recognized apprenticeship continued to persist to a greater or less extent. Provision for such employed learners has been provided either through public schools and programs conducted and controlled by the employees, or through private agencies. Part-time continuation schools in which attendance is compulsory are now in operation in some twenty-six states, while various schemes of what are known as "part-time courses for apprentices," where the apprentice attends school for the purpose of receiving technical and related instruction for from 4 to 8 hours a week on the employer's time, have developed to a considerable extent in some parts of the country.

Certain similar courses have been developed to some extent in the field of commercial education, especially by various employing concerns. This particular type of provision for employed learners is obviously dependent for its development upon the corresponding development of a definite learning stage following initial employment. It may be interesting to note that this development of apprenticeship has gone much farther in certain of the British dominions, such as South Africa and New Zealand, than it has in this country, although cities like Chicago, Cleveland, Boston, and Baltimore have developed very effective schemes for the supplementary training of apprentices, particularly in the building trades.

Adult Learning.—The general tendency in this country in the past has been to neglect the adult as an educational asset; in fact, there has existed a tradition to the effect that the adult could not learn. This tradition has been recently disproved by very extensive studies. In the field of vocational education provision for adult education has been rapidly extended through such agencies as the correspondence school, the courses conducted by the Knights of Columbus and the Young Men's Christian Association, and through various institutes, as well as through evening extension classes conducted under the provision of the state laws enacted complementary to the National Vocational Education Act. In the field of adult education we are far from knowing the extent to which adults are being taken care of from the standpoint of opportunities to secure some form of vocational education. We do know that the evening commercial high school is a comparatively recent development. We know the tremendous development of correspondence schools, and of university extension courses, and we know many adults are served through the educational work of various departments of the United States Government, such as the Department of Agriculture and the Department of Commerce. In the particular case, however, of evening extension courses aided by the terms of the National Vocational Education Act, it is quite safe to say that out of the present year's registration of about 1,000,000 students, over half, and probably two-thirds, were employed adults. The problem of adult education is therefore receiving more serious consideration in both the vocational and general educational fields.

TRADE AND INDUSTRIAL EDUCATION

Part-Time Schools.—Trade and industrial education is intended particularly to assist those engaged in mechanical trades or industrial pursuits. The part-time continuation school is particularly intended to deal with young employed persons between the ages of 14 and 16 and has for its objective the general improvement of civic and vocational intelligence. These schools have not been in operation long enough in many cases to be able to determine exactly how they can render the greatest service to the special groups they reach.

There is little doubt, however, that a good deal of time, energy, and money has been expended in experimental work which has not been as fruitful as it might have been. The most progressive point of view with regard to the function of these part-time continuation schools at the present time seems to be that their objective should be, so far as any school can do it, to assist an individual to adjust himself successfully to all the demands of life, including employment, particularly with regard to those situations with which he has to deal during the earliest stages of adolescence. The tendency has been to get away from the idea that the function of these schools is merely to continue formal education of the type given in the upper grades of the elementary schools and the lower grades of the high schools.

Trade Training.—Trade training is now carried on in this country largely through the following agencies: (1) correspondence schools, (2) semi-philanthropic endowed institutions, (3) publicly supported trade schools or trade courses, (4) part-time ap-

prenticeship programs operated either in cooperation with trade schools or operated by employing concerns entirely at their own expense and under their own control. The trend at the present time in trade training is in the direction of the development of more and more part-time programs as against the preemployment full-time program. This is true for several reasons. In the first place, a part-time program is carried on with employed learners, hence a considerable amount of the problem of selection is automatically solved. Those who can not meet the requirements of the occupation are automatically eliminated through inability to secure employment or discharge from employment due to inefficiency and the problem of securing a properly selected group is reduced to a minimum. In the second place, the paralleling of instruction in technical and related subjects with actual progressive training in the occupation provides the best conditions for the highest degree of correlation and for securing an occupational environment superior to that of any school shop. A third advantage of the part-time scheme is that, since it utilizes the resources of the occupation itself in the form of environment and equipment rather than providing them at public expense, as in school shops, the cost is very materially reduced. All of these facts have led to the present opinion on the part of many vocational educators that the part-time program is unquestionably the most efficient where it can be successfully administered and operated.

Part-Time Limitations.—There are certain limitations of the social service value of the part-time training program. They are largely due to the fact that there exists in industrial occupations, as in most other occupations, a minimum age or maturity limit below which employment is not desirable or in many cases cannot be secured. In certain states the compulsory school attendance law ceases to function at about the age of 14 years, whereas what may be called effective entrance into a trade with the status of a learner cannot be secured much under 16 years of age. This leaves a gap for about two years, during which young people are perfectly free to leave the regular public school or the corresponding private school and may either do nothing at all, or work at juvenile jobs, which do not lead anywhere in particular. The setting-up of an agency whereby this group may take two or more years of definite organized training looking toward advantageous entrance into trade employment at the age of 16 or 17 seems to be justified, and where these conditions exist, it is obvious that the only satisfactory device is the full-time trade school which, when it is efficiently operated, practically gives a training equivalent to a certain proportion of apprenticeship training, usually from one third to one half, although certain of these schools giving a four-year course have turned out graduates fully the equal of the ordinary four-year apprentice.

Foremanship.—A phase of trade and industrial education which has recently been receiving marked attention and which is being considerably developed in the last few years is work for the promotion of better foremanship. This work has taken a variety of forms. Among others has been the formation of foremen's clubs which are now represented by a national association. Another form has been the giving of special courses by various commercial service agencies and still another form has been carried on through the public schools by what is known as the conference method of foremanship extension training.

In general, the objectives of such work have been either (1) the providing of information with regard to the work of various departments or to the organization or the distributing problems of the plant, or (2) work whose objective has been to assist the foreman to discharge more intelligently his duties. It is in this latter field that the conference has been found of particular use. The recognition of the foreman as a very important key individual in industry has led to a considerable development

of these various forms of training, and at the present time work of this kind is being carried on successfully in many large corporations. In certain cases similar work has been carried on for the training of individuals who were in line for promotion, such as training assistants for foremanship. Minor executives engaged in this special type of work have been trained in publicly financed and controlled evening classes. A number of the states are now employing individuals who specialize in this line of vocational work. The results on the whole have been of great value in those concerns which have undertaken in some way to deal with the question of improving foremanship.

The development of the particular device for improving foremanship on the horizontal level, known as the conference, can be fairly attributed to the original research work carried on in 1918 by a committee of foremen in cooperation with representatives of the Federal Board for Vocational Education. As a consequence a definite technique has been established, and the value and limitations of this device have been pretty well defined. Since then the Federal Board has continued its research work in the direction of determining the best way for training representatives of plants and of state boards for vocational education for carrying on this work successfully, and a definite technique in the training of conference leaders has been developed. Some successful work in the training of conference leaders has been carried on, in part by agents of the Federal Board working on a research basis and in part by representatives of state boards for vocational education.

AGRICULTURAL EDUCATION

Federal and State Plans.—Agricultural education has been carried on in this country for something like 60 years from the beginning of the establishment of the agricultural and mechanical land-grant colleges. These colleges give training of college grade not only for the direct practice of agriculture but for the practice of related occupations. Agricultural education of less than college grade is in general carried on through agricultural courses in rural high schools or in other schools of less than college grade, these courses being federally aided under the terms of the National Vocational Education Act and state aided under the terms of the State Acts complementary to the National Act. Under the requirements of the State Plan these courses are usually operated for 90 minutes a day, with the requirement that each student shall spend at least an equal amount of time upon what is known as supervised farm practice work on his home farm or on some other farm where he can secure the necessary facilities. These projects are sample agricultural enterprises. They may involve the planning and the raising of a crop or of the working out of some practical problem in animal husbandry or some other typical problem in aricultural work. Where these courses are operated successfully there has been a distinct increase in the efficiency of agricultural activities.

For Adults.—Agricultural education for adults is provided in this country in several ways: first, through the unorganized educational work of the country agents representing the United States Department of Agriculture, and through the literature put out by that department, as well as by the experiment stations maintained at the various agricultural colleges. The second chief agency is through vocational evening courses of an organized character given to groups of adult farmers and through vocational part-time courses for farm boys who have left the regular school and are employed on the farm. Both of these agencies are conducted under the provisions of the state plans and are therefore Federally and state aided. The major development in Federally aided agricultural vocational education up to the present time has been in the aricultural courses in the rural high schools, although some progress has been made of a gratifying character in the development of evening courses and part-time courses. Services rendered by the Department of Agriculture are almost

entirely on an unorganized or demonstration basis, and naturally are confused with service to adults, with the exception of the development of boys' and girls' clubs which has become a considerable activity.

COMMERCIAL EDUCATION

Commercial education is commonly understood as including training for office occupations. It is not understood to include training for the higher levels of management or the conducting of a large business enterprise, these activities being taken care of in schools of commerce in certain colleges. At the present time the situation in commercial education is somewhat unsatisfactory. Commercial courses or commercial departments exist in almost all American high schools. These departments, however, as a rule, confine their instruction to typewriting, bookkeeping, and stenography. It is claimed by many experts in this field that the theory of parallelism referred to earlier in this article has not been applied here because, with the high degree of specialization now developed in office practice, the stenographer and the typist hold a relatively small place, and the bookkeeper of the old-fashioned type has practically been done away with except in the very smallest commercial establishments. Consequently, criticism is constantly directed against these commercial departments that they are not up-to-date; that they have not developed their work so that it parallels the development in office practice. Improvements are continually being made.

One reason sometimes alleged for this situation is that but few states or local communities have provided supervision for commercial education. Another reason is that commercial education cannot be Federally aided under the terms of the National Vocational Education Act except so far as such work may be given in the part-time continuation schools. As a result it is claimed that the encouragement which Federal aid has always carried with it has not operated in this field. One evidence of this lack of parallelism in commercial courses of secondary grade has been the extraordinary number of private business colleges which have very successfully given forms of training to enable their graduates to fit into up-to-date office practice, whereas this has been less true of the average graduate of the commercial department in the average high school.

HOME ECONOMICS EDUCATION

Home economics education is now considered as covering the entire range of activities of the woman in the home, including both management and operation. Work of this character can be Federally aided and is largely carried on, so far as the public schools are concerned, very much as is the work in agriculture; i.e., special courses in home economics are carried on in high schools. Whereas in home economics the supervised home project is not required by the terms of the act in order that the course may secure Federal aid, such project work is very commonly connected with the work in the high schools. Education for adults in home economics is given very largely through evening courses, which are also under public control and are Federally and state aided. In addition, such courses are given in certain institutions of semi-philanthropic character, and of course many institutions of a private character also offer this same type of instruction. Service to adult women in rural communities of an unorganized and demonstrative character is also provided by the Department of Agriculture through its home demonstrations. One difficulty in the development of programs of home economics has been in analyzing the field and in determining just what its limitations should be. On the whole, however, the work carried on has been of great social advantage, and there is very little doubt but that it has resulted in better homes and in more intelligent home management.

VOCATIONAL EDUCATIONAL AGENCIES

Classes.—The agencies through which vocational education is now

being operated have practically been divided into five groups: (1) Federally aided schools and courses, (2) enterprises operated entirely by employing agencies which are in no way connected with the public schools, (3) what are termed "semi-philanthropic agents," which although not under public control, essentially serve the same function as public schools by providing educational service for a nominal charge, (4) profit-making agencies, (5) the services of various state and Federal departments.

Private Agencies.—At the present time many corporations and certain organizations of employers operate schemes of their own which they control and finance, such as the programs of the American Telegraph & Telephone Company, the Bell Telephone Company, the National City Bank of New York, and many others, including a number of railroads. These training schemes are naturally confined to the employees of the particular corporation who operate them, and deal entirely with the particular technical knowledge and the objectives which go with their own special work.

Since these programs are operated privately, there is but little detailed information available as to their extent or their methods. On the whole, however, these corporations or business training plans function with a considerable degree of success, and in many cases have probably been more efficient than any other type of training.

PUBLICLY CONTROLLED VOCATIONAL EDUCATION

Federal and Local Programs.—Vocational education as a part of the public school system practically dates from 1917, the date of the passage of the present National Vocational Education Act. Under the stimulus of Federal and state aid and of the state boards for vocational education, which have been established in every state and in the Territory of Hawaii, great advances have been made in public school vocational education. In the vast majority of cases the programs have been developed by local communities with the assistance of the State department of vocational education. In some few cases, however, these programs have been developed directly by the states themselves and have been operated as state programs. This is true, for example, of Connecticut and North Dakota.

Conditions For Aid.—In order to receive Federal aid it is necessary that the state submit a plan which is approved by the Federal Board for Vocational Education indicating just how the state proposes to carry on any work for which Federal funds are to be applied in part reimbursement of the cost of the program. The conditions of approval are those essentially set up in the National Vocational Education Act, which are in essence that the work must be under public control, must be suitable for persons 14 years of age or over, and that it must be for the benefit of those who have entered upon or who are preparing to enter upon a gainful occupation in the fields of agriculture, trade and industry, or in the field of the work of the woman in the home.

Duties of Federal Board.—The Federal Board for Vocational Education operates no schools, employs no teachers, but is charged under the Federal act with the responsibility of seeing that Federal funds are used in accordance with the specifications of the approved state plans and is also charged with the duty of conducting researches and collecting and disseminating information in the field of vocational education. At the present time the students enrolled in state and Federally aided courses of all types number a little over 1,000,000. In the last year there has been an increase in the relative development of part-time and evening schools as compared with day schools, although all types of schools have increased during the year.

Appropriations.—The Federal appropriation has now reached its maximum of approximately $7,000,000, and as this appropriation must be met at least by either state or local funds, or both, the minimum expen-

diture for vocational education of this type of less than college grade is approximately $14,000,000. However, a number of states have expended an amount of money considerably in excess of that required to match Federal funds, the figure having been for the last two or three years approximately $2.50 per dollar of Federal funds, and this proportion has steadily increased during the years that the program has been in process of development, so that the total public expenditure for Federal and state vocational education of less than college grade now amounts to approximately $25,000,000.

Personnel of the Federal Board.—The Federal Board for Vocational Education is what is known as an independent establishment; that is, it is not attached to any government department. It consists of a board of seven members, four of whom are *ex-officio*—the Secretary of Commerce, the Secretary of Labor, the Secretary of Agriculture, and the United States Commissioner of Education. In addition, there are three members appointed by the President,—one a representative of labor, one as a representative of agriculture, and one as a representative of employers, thus constituting what is known as a representative group. The Board is responsible directly to the President and to Congress. It was the opinion of those who promoted the original legislation that an independent representative board responsible only to Congress and to the President, which contains representatives of the parties in interest, was necessary for the successful development of a program of vocational education under public control, and their point of view was accepted by Congress, resulting in the present form of the Federal Board for Vocational Education. Each of the three presidential appointees serves a three-year term, and the terms are staggered.

The executive staff of the Board consists of one director, a chief of the trade and industrial service, a chief of the agricultural education service, a chief of the commercial education service, a chief of the home economics education service, together with an editor and educational consultant to the Board. Each of these services has a certain number of agents, so that the total executive staff of the Board amounts to 24, all of whom, including the director, are under the Federal Civil Service.

Objectives of the National System.—The general purposes which were to be secured through national legislation providing Federal aid for vocational education, as expressed in the report of the commission on whose recommendations the act was written and enacted by Congress, were as follows:

1. That since large numbers of young people drop out of the regular public schools and are forced to enter into employment without any training which would assist them to either get better jobs or to advance subsequent to employment.
2. That since large numbers of adult workers and women in the home were obliged to secure such training as they needed for advancement or for better work on their jobs from private agents at their own expense.
3. That there was no reason that provision should not be made to take care of these prospective and actual workers in the same way that the educational needs of other citizens were being taken care of through public provision for general education.

The objectives or the purposes, therefore, were to encourage the states to either set up state programs or to encourage local communities within the states to establish such programs which would constitute an extension of the educational program of the State or of the local community into the field of vocational education, that extension being especially intended for the benefit of employed adults and of prospective workers. On the whole, the objectives of this act have been fairly well attained up to the present time.

RELATION OF VOCATIONAL EDUCATION TO OTHER EDUCATION

Distinctions.—In some parts of the country considerable confusion has arisen as to the distinction between vocational education and industrial arts and manual training. It is now considered that industrial arts and manual training are part of the gen-

eral educational program. They may serve in certain cases in helping an individual to find out what he likes to do and what he can do and they form a valuable educational agency for the general education of boys and girls. Because this involves working with machines and tools and the construction of articles, it has often been difficult for many people to distinguish between such educational work and vocational education. The characteristics of vocational education are: first, that it is only given to people who want that kind of education and who will subsequently use it to earn their living; and, second, that it shall be taught in such a way that the practices of the occupation itself are taught as they are carried on in the occupation, so that persons who receive that instruction may immediately capitalize it to their own advantage and to the advantage of society.

TRAINING VOCATIONAL TEACHERS

General Requirements.—The provision for the training of vocational teachers in the art of teaching what they already know and can do is carried on in various ways. In the case of teachers of agriculture and home economics, this training is given very largely in the land-grant colleges, certain professional courses being introduced in the junior and senior years. In the case of Federally aided agricultural and home economics courses, all state plans require that the teacher shall be a graduate of a college and shall have had certain definite technical and professional training, together with a certain required amount of practical experience in the occupation which they teach.

In the case of trade and industrial education, the situation is somewhat different. The teaching is chiefly carried on through the state boards for vocational education largely in evening classes, because in trade and industrial education the occupational requirements are comparatively high and it is necessary to make it possible for a man to be working at his trade, and if he desires to become a teacher of that trade for him to secure his training in his leisure time.

In addition, a great deal of work is done in what may be called the professional improvement of employed teachers. This is partially carried on, particularly in the field of agriculture, by itinerant teacher trainers. It is carried on in all fields of vocational education through summer school courses given in the land-grant colleges; and in certain colleges and universities, and unorganized improvement is carried on through the work of state and local supervisors of vocational education.

Occupational Requirements. — The principle that an individual who cannot do a job himself cannot teach anyone else to do it has been thoroughly accepted in the field of vocational education at this time. Its application appears in the general requirement that vocational teachers must have had successful experience in the occupation which they teach. In the case of Federally aided vocational education all state plans set up as a prerequisite to employment a definite minimum period of employment in the occupation which is being taught. In the case of private agencies for vocational education this principle is generally accepted as a matter of course.

Special Purpose of Teacher Training.—When the present program of vocational education under public control was initiated, it was realized that the agencies which were then preparing teachers for the general schools, that is, the normal schools and colleges, were not in a position to give the special training necessary for work in this field. Consequently, the National Vocational Education Act annually provides the sum of $1,000,000 which is distributed among the states, on the condition that the states provide at least an equal sum, for the purpose of encouraging the establishment of special training for vocational teachers. These programs, however, only include agricultural, home economics, and trade and industrial teachers. Up to the present time there is no definite agency which is training commercial teachers to

teach in high schools and so far as private corporations are concerned, they have either secured teacher training for their instructors through the services of state departments of education, or they have conducted some sort of a teacher-training program themselves.

CIVILIAN VOCATIONAL REHABILITATION

Purposes.—It has long been recognized that social waste and inefficiency result from any situation in which individuals who could maintain themselves by their labor and who therefore could become contributing citizens rather than parasites are prevented from taking their proper place in society through handicaps resulting from accident, disease, or congenital affliction. One result has been the establishment in many states of compensation acts whereby an individual handicapped through industrial accident receives a certain sum of money. In many cases, where the employee was injured in the line of duty, the employing concern has found a job for him which practically partook of the nature of a pension in that the job as a rule was one in which he could no longer exercise the knowledge and skill he had secured previous to his injury.

Neither the Compensation Acts nor the general method of taking care of injured employees functioned in any way to restore the vocationally handicapped person to productive ability comparable with that he possessed previous to being injured, nor did they take account at all of the large number of congenitally handicapped citizens who yet possessed potential powers of becoming self-supporting. Some agency was evidently needed to retrain handicapped citizens so that they could either resume their original work or successfully carry on other work of an equivalent character in terms of their income-producing value.

Federal Aid.—Recognition of this situation has led to the enactment of the Civilian Vocational Rehabilitation Act, whereby a sum of approximately $1,000,000 is allocated to the states for the purpose of encouraging the establishment of agencies whose purpose is to rehabilitate vocationally handicapped citizens, whether that handicap be brought about through accident, not necessarily industrial, or through some form of physical disability. The use of Federal funds is conditioned on the providing of an equal amount of money from the state or from sources within the state. At the present time the majority of states have enacted legislation complementary to the Civilian Vocational Rehabilitation Act, and have programs which are in more or less successful operation. The social and economic advantages of returning to economic productive ability individuals who for any reason have lost that ability are obvious. Nevertheless some states have not yet enacted the necessary legsilation.

Inquiries.—The usefulness of this Federal vocational training suggests the following questions: (1) Can vocational rehabilitation be practically carried out? (2) Does it actually work; that is, do rehabilitated people actually become permanently self-supporting? (3) What is the cost? (4) How does the cost of rehabilitation compare with the probable value of the earnings of the rehabilitated citizen during his expectation of working life? Answers to these questions have been found recently through a very complete study of some 6,000 cases of rehabilitation carried out by the Federal Board for Vocational Education in cooperation with the states. While this study is not complete, the data secured have been studied sufficiently to indicate that the questions heretofore given can all be answered in the affirmative. Since the beginning of the program in 1920, over 34,000 persons have been rehabilitated, and at the present time (1928) about 15,000 are in process of rehabilitation. Of these, 13 per cent are women and 87 per cent men, the ages ranging from under 21 to over 51. Forty-nine per cent of the disabilities were due to employment accidents, 19 per cent to public accidents, 27 per cent to disease, and 5 per cent were congenital.

The occupations within which disabled persons were rehabilitated have a wide range. The study showed that rehabilitated persons were working at 700 different jobs ranging from unskilled employment to professional work.

The average cost of rehabilitation was found to be $235. The expenditure of this sum from public funds has therefore not only restored an individual to normal status, but has prevented the expenditure of $300 to $500 per year, which is required to maintain in the poorhouse or custodial institution a person who is unable to work for a living.

Certain significant figures have also emerged from these data. In the State of Alabama the average weekly wage of disablement of all persons rehabilitated in 1924 was $9.21, whereas after rehabilitation the wage was $21.75. Of the group rehabilitated, 77 per cent had no earning power during the period of disablement, while 38 per cent had never worked prior to rehabilitation. The average weekly wage of those working was $17.11, whereas after rehabilitation the wage of this same group became $22.75. Furthermore, the average weekly wage of the group that had never worked until rehabilitated was $19.20.

In the same way, the State of Wisconsin shows, on the basis of 1036 disabled persons rehabilitated, the total gross annual earnings before rehabilitation were $499,208.09, whereas subsequent to rehabilitation the total gross earnings have been $1,159,948.18, or an increase in annual per capita earnings of $638, with a per capita cost of rehabilitation of $242.37.

RELATIONS OF STATE PROGRAMS TO THE FEDERAL GOVERNMENT

As represented by the Federal Board for Vocational Education, these are essentially similar to the relations set up in the Civilian Vocational Rehabilitation Act. Responsibility for the development and administration of a program is placed upon the state boards for vocational education which were already established in the states as the state authority responsible for state programs of vocational education. Plans are prepared and submitted by each state as in the case of the National Vocational Education Act. State boards of vocational education employ experts who specialize in this line of work. The only important difference between the administration and operation of the two programs is that in vocational education, in the great majority of cases, the actual programs are local assisted by state funds and by state supervision, whereas in the rehabilitation work up to the present time the programs have been carried out entirely by the state boards for vocational education, although there is no particular reason why large communities should not establish their own rehabilitation programs.

ORGANIZED LABOR AND VOCATIONAL EDUCATION

Favor.—There has been a great deal of misapprehension with regard to the attitude of organized labor toward vocational education. Some of this has undoubtedly been due to ignorance; in other cases it may have been due to certain experience with local unions. The record of organized labor, however, is one of indorsement of vocational education, limited only by acceptance of certain conditions of which the most important are as follows: 1. Vocational education should be real vocational education. The product of vocational education shall not be, in the language of the trade, a "half-baked" mechanic. 2. Vocational education should be under public control. 3. Labor having a vital interest in vocational education is entitled to representation in the control of vocational education.

Origin of the National Aid System.—With regard to these matters the record of organized labor is plain. It is already given in a letter prepared by William Green, president of the American Federation of Labor, detailing the attitude of the Federation toward the whole question of vocational education. By permission of the American Federation of Labor, a copy of this letter was recently placed in the hands of all state directors of

vocational education and state supervisors of trade and industrial education by the Federal Board for Vocational Education, and the following extracts are quoted from that letter:

"Early in the 20th century an organization was formed in Boston known as the National Society for the Promotion of Industrial Education, which had for its object the raising of the standard of education along industrial lines. Charles H. Winslow, Secretary of the Society, appeared before the convention of the American Federation of Labor then in session in Norfolk, Va., on November 22, 1907, and explained the objects of the Society. Mr. Winslow was also organized labor's representative on the Massachusetts Commission on Industrial Education.

"Mr. Winslow appeared before the Committee on Resolutions of the Convention and gave much valuable information. After much discussion in which what are known as 'trade schools,' organized for profit, were condemned, a report was made to the convention which adopted the following:

> 'We favor the best opportunities for the most complete industrial and technical education obtainable for prospective applicants for admission into the skilled crafts of this country, particularly as regards the full possibilities of such crafts, to the end that such applicants be fitted not only for all usual requirements, but also for the highest supervisory duties, responsibilities, and rewards; and the Executive Council is directed to give this subject its early and deep consideration, examining established and proposed industrial school systems so that it may be in a position to inform the A. F. of L. what in the Council's opinion would be the wisest course for organized labor to pursue in connection therewith.'

"The 1908 convention authorized the president to appoint a committee to investigate the methods and means of industrial education in this country and abroad and report to the next annual meeting. In 1909 the committee appointed by direction of the previous convention made the report in which it was said:

> 'There should be established, at public expense, technical schools for the purpose of giving supplemental education to those who enter the trades as apprentices. . . . To favor the establishment of schools in connection with the public school system at which pupils between the ages of 14 and 16 may be taught the principles of the trades, not necessarily in separate buildings, but in separate schools adapted to this particular education, and by competent and trained teachers. . . . Any technical education of the workers in trade and industry being a public necessity, it should not be a private but a public function, conducted by the public and the expense involved at public cost.'

"In 1910 President Gompers and Vice Presidents Mitchell and O'Connell and Secretary Morrison held conferences with Secretary Nagal of the Department of Commerce and Labor, and Secretary Neill of the Bureau of Labor to request that the United States Department of Commerce and Labor investigate the entire subject of industrial education. Investigation was begun April 3, 1910.

"A vocational education bill was drawn by the Committee on Education of the American Federation of Labor and was introduced by Senator Dolliver.

"During the 62d Congress Senator Page of Vermont reintroduced the Dolliver Bill and the Senate Committee on Agriculture authorized him as a subcommittee of one to correspond with the leading educators and others interested in the purpose of the proposed measure and to report to the full committee the report of his investigation. He was requested to submit a bill amended to conform to the suggestions he might receive or any he might have to make. The committee approved the general purpose of the bill. Representative Wilson of Pennsylvania introduced in the House a companion bill to that presented by Senator Page in the Senate.

"Senator Page made an exhaustive investigation of the question of industrial education, securing from the President and Legislative Committee of the American Federation of Labor much valuable information. He amended his previous bill to meet the changes necessary, because of more definite information, and introduced it in the Senate. The Agriculture Committee reported it favorably, February 26, 1912. Representative William B. Wilson submitted in the House a companion bill to the amended bill of Senator Page.

"In 1914 Congress passed a resolution providing for a commission to consider the need and report a plan for Federal aid for vocational education and trade and vocational training. This commission made its report to both Houses of Congress June 1, 1914. The 1915 convention of the American Federation of Labor contended that the Federal Government should afford generous financial aid to vocational education which was fraught with so much value to the workers, to the people generally, and to the stability of our country.

"July 31, 1916, the United States Senate passed a vocational trade-training bill by Senator Hoke Smith of Georgia. The companion bill by Representative Hughes of Georgia was reported favorably on July 10, 1916. Definite action was prevented by Representative Mann of Illinois. The Senate bill provided for a Federal Board for Vocational Education consisting of the Postmaster General, Secretary of the Interior, Secretary of Agriculture, Secretary of Commerce, and Secretary of Labor.

"Notwithstanding this opposition, through the efforts of the American Federation of Labor the bill passed the House, January 9, 1917. The measure then went to conference and was agreed to by the House and Senate on February 16, 1917. President Wilson signed the bill February 23, 1917.

"This legislation has been of great benefit to the wage earners of our country. Since the law providing for the rehabilitation of persons injured in industry, commerce, and agriculture was enacted, the Federal Board for Vocational Education has had charge of that work. Thousands of persons would have

been unable ever to work again in any employment if it had not been for the rehabilitation law.

"As the American Federation of Labor was the originator of the agitation for the law providing for the Federal Board for Vocational Education, it is not necessary to answer the question what is its attitude toward labor."

COOPERATION WITH LABOR

From the above it appears that organized labor, as represented by the American Federation of Labor, was largely responsible for the initiation of the legislation which resulted in the passage of the National Vocational Education Act. Representatives of organized labor have almost invariably cooperated with state directors and state supervisors in the attempt to secure more and better programs of vocational education. Wherever, as has sometimes happened, certain individuals in a local community have objected to the establishment or the operation of an educational program, usually through some misunderstanding as to the objectives of the program, the leaders of organized labor have always assisted in straightening out the difficulty. Certain criticisms have unfortunately been justified. Vocational programs have been established in this country under conditions which could not possibly turn out a graduate who was properly educated in the trade, whatever that trade might be. It is also greatly to be regretted that in many cases school authorities have not felt that the cooperation of organized labor was necessary or desirable. This statement is more true of the past than it is of the present, or will be of the future. Wherever representatives of organized labor have been called upon to cooperate in the setting up of more efficient programs, in the determination of functioning content, or in serving on administrative and coöperative committees, they have almost invariably responded and have given loyal and efficient service.

ADULT EDUCATION

By Mary L. Ely

American Association for Adult Education

DEFINITION

Adult education is a comparatively new term for a few new ventures in educational theory and practice, and for a great many older types of education, viewed in a new light and transformed by a new spirit and new purpose.

From whatever angle one approaches adult education its diversity is apparent. Even a satisfactory definition can hardly be given in a single, simple statement. So many misconceptions of the nature of adult education are current that a number of negations seem necessary before an affirmative statement can be attempted.

Exclusions.—Adult education is not Americanization of the patriotic propaganda type. When education of the foreign-born is directed toward helping them to adjust themselves more fully, freely and happily to their new environment, it comes within the province of adult education: otherwise, it does not. Adult education is not propaganda for any social, religious or political cause, whatsoever. In intention, it is, on the part of every person engaged in it, a disinterested search for truth, regardless of personal cost.

Adult education is not vocational education. It is concerned with attitudes toward life; not with means for earning a livelihood, nor is it not belated childhood or adolescent education. Essentially, it is education which is addressed to adult intelligence and which takes account of adult experience.

Purposes.—"It is sought to make of adult education," writes Everett Dean Martin,[1] "something which will broaden the interests and sympathies

[1] Martin, E. D. *The Meaning of a Liberal Education.* 1926, p. 3.

of people regardless of their daily occupation—or along with it—to lift men's thought out of the monotony and drudgery which are the common lot, to free the mind from servitude and herd opinion, to train habits of judgment and of appreciation of value, to carry on the struggle for human excellence in our day and generation, to temper passion with wisdom, to dispel prejudice by better knowledge of self, to enlist all men in the measure that they have capacity for it, in the achievement of civilization." This may well stand as the statement of what adult education is.

CONTRIBUTING AGENCIES

The agencies engaged in adult education include, in addition to those already noted, libraries, museums, extension services of departments of the Federal government, open forums, people's institutes, correspondence schools, corporation schools and programs, national associations, fraternal and religious; child welfare groups, child study groups, women's clubs, men's clubs, book clubs, and luncheon clubs. Among those in which foreign influences are strong, are people's colleges and folk schools, borrowed from Denmark and adapted, to some extent, to American conditions; study circles, copied from those of Sweden; labor schools and other workers' education activities, much of the inspiration for which has come to us from England. There are to be added to the list, further, many American enterprises so individualistic as to defy classification. Nor is this all: for example, the growing importance in education of radio broadcasting, motion pictures and newspapers is already affecting the initial concept of adult education.

TYPES OF ACTIVITIES

Grammar and Evening Schools.—Since adult education is addressed chiefly to men and women whose primary interest lies in a vocation, its program is, of necessity, adjusted to times of leisure. It is natural, therefore, that it concentrates in evening classes and summer schools. The former may meet several times a week or as infrequently as once a fortnight. The latter vary in length of session from a few days at labor institutes to eight weeks,—which is the period covered by the Bryn Mawr Summer School for Women Workers in Industry, one of the oldest and best known of the adult education summer schools. Only one other workers' school dates back to 1921 when the Bryn Mawr School opened: seven years later, during the summer of 1928, there were nearly a score of adult education summer sessions.

Sunday and Travel Programs.—No hours of leisure are neglected in adult education programs. Open forums, lectures and discussion groups are scheduled frequently for Sundays, especially in the larger cities. One of the latest adult education enterprises, embarked upon in Los Angeles, California, in October, 1928, and christened The Commuters' School, seeks to utilize the enforced leisure of commuters during their hours of daily travel.

In Rural Areas.—The promotion of adult education has not been confined to the cities and larger towns where it is easiest and procedes most rapidly. Several experiments now in progress are designed to test methods for opening up adult education opportunities in rural communities and small towns. One of these, initiated in the fall of 1927 under the auspices of the National Community Foundation, has been carried on in sixty small cities and towns of the Middle Atlantic States, and is now being pursued intensively in selected towns of Chester County, Pa. A second experiment, in which Michigan State College has been one of the agents, is centered in two counties of Michigan.

The object of both of these enterprises has been to investigate the possibilities of linking educational programs for adults with the movement for community organization. A third experiment, which closed in June, 1928, has tested the feasibility of sending a traveling teacher into mill villages of New England. A report on this experiment is in preparation. Another traveling teacher circuit has been formed in a number of small

cities of Western New York. A rural county experiment, involving the probable development of an educational program, is being conducted by the California State Board of Education.

In Urban Communities.—In urban communities two tendencies have already become apparent. One is toward the coördination of adult education activities in an inclusive community program; the other is in the direction of decentralization, with the employment of the coördinating body as a safeguard against duplication and competition of effort. Self-surveys, as a first step in the coördinating process, have been made in Buffalo and Cleveland and reports have been published. During 1928, similar surveys were in progress in Chicago, Detroit, St. Louis and Brooklyn.

Foremost among individual city enterprises that are worthy of special comment are the People's Institute of New York City, which offers courses of instruction of an exceptionally high standard; the New School for Social Research, also located in New York City; and the Institute for Social Education of Dallas, Texas, which furnishes, perhaps, the best example in the country of a private educational venture for adults that has been accorded community-wide importance and support.

ORGANIZATION

American Association for Adult Education.—It was the recognition of the significance of the movement for adult education in other countries and of the increasing interest in various forms of continuing education in the United States that led to an inquiry into American conditions, made in 1924 by the Carnegie Corporation of New York. A series of *Studies in Adult Education* (Macmillan), covering five broad phases of the subject, was one of the direct results; the organization of the American Association for Adult Education in 1926 was another.

The Association's main function has been that of a clearing house through which the experience and findings of every adult education enterprise may be made available to others. It has sought to interpret, to explain, to clarify and to serve as a supplemental agency to other agencies—community, state, regional and national. During 1928, records made in the central office of the Association in New York show that it has been in active contact on adult education matters with about 400 organizations, each of more than local scope. Membership in the Association is open to all who are interested in adult education.

Emerging Tendencies.—The Association has had three annual meetings, each of which has shown how various are the elements contributing to the movement. At the same time, these meetings, especially the latest one held at Swarthmore, Pa., in May, 1928, have made manifest an increasing unity of purpose and a general tendency toward likeness, or at least comparableness, in materials and methods.

All adult education activities are alike in certain important respects which differentiate them from compulsory education of children and adolescents. Adult education students are men and women of experience and of more or less developed interests and concerns, and, what is equally important, they are voluntary students and continue in classes and schools only so long as the program offers something that seems vital and worthwhile to them. This means that, in the planning of adult education curricula, the needs and desires of the students must be consulted to an extent that is seldom considered practicable in the case of younger students.

Significant changes have sprung from this circumstance. The academically minded have been called upon to meet a demand which cuts across the traditional divisions of knowledge and takes, wherever it can find the material that contributes to an understanding of human situations and problems. On the other hand, those who are inspired by brotherly love and a desire for universal educational salvation have recognized the fact that an educational program

needs a firmer foundation than utopian yearnings and altruistic sentiments.

The experience of adult education students must be taken into account not only in the choice of subject and content for study, but also in the presentation whenever that experience can help to elucidate the question under consideration. To achieve that end the discussion method, which gives the students an opportunity for active participation, has been widely used. Among adult education leaders and teachers something of a technique of discussion is now being developed.

RESEARCH AND EXPERIMENTATION

One of the very important functions of the American Association for Adult Education is the promotion of study and experimentation in the field of adult education. Among the experiments that are being carried on under the auspices of the Association are three of the rural and small-town studies already cited—in Michigan, in Chester County, Pa., and in New England. Toward the working out of teaching methods and subject-matter, four teacher-training courses in which the Association cooperated with the New School for Social Research, New York, are being followed up with experimental classes conducted by the People's Institute of New York.

The question "Can adults learn?" so directly affects the validity of the whole movement for adult education that, at the instance of the Association, an answer, as authoritative as scientific experimentation could make it, has been sought. After three years of testing the ability of adults to learn at various age levels, Professor E. L. Thorndike and his associates at Teachers College, Columbia University, have just published their results in a volume entitled *Adult Learning*. (Macmillan.) Briefly stated, Dr. Thorndike's conclusions indicate that, within limits which extend to forty-five years of age and beyond, the best time to learn anything is the time when one needs or wishes to know it.

A study, seeking to determine the influences which account for the formation of reading habits, or the lack of them, has been undertaken by a committee of which Dean William S. Gray, of the College of Education, University of Chicago, is chairman. A report is said to be in process of publication.

For the past two years, the Association has published occasional news bulletins which were distributed to its members. By vote taken at the annual meeting, May, 1928, it was decided that, in the opinion of the members of the Association, the movement for adult education in this country has advanced to a point where it calls for the regular issuance of a full-sized *Journal of Adult Education*. The new Journal made its first appearance, January, 1929.

BIBLIOGRAPHY

Evans, O. D. *Educational Opportunities for Young Workers*. Macmillan.

Fisher, D. C. *Why Stop Learning?* Harcourt, Brace.

Hall-Quest, A. L. *The University Afield*. Macmillan.

Hodgen, M. T. *Workers' Education in England and the United States*. Dutton.

Lindeman, E. C. *The Meaning of Adult Education*. New Republic Press.

Martin, E. D. *The Meaning of a Liberal Education*. Norton.

Noffsinger, J. S. *Correspondence Schools, Lyceums, Chautauquas*. Macmillan.

Peffer, Nathaniel. *New Schools for Older Students*. Macmillan.

Robinson, J. H. *The Humanizing of Knowledge*. Doran.

Thorndike, E. L. & others. *Adult Learning*. Macmillan.

PURE RESEARCH IN EDUCATIONAL INSTITUTIONS

By Elbert Vaughan Wills

Editor-in-Chief, U. S. Navy Department Standard Stock Catalogue

DEPENDENCE UPON EDUCATIONAL INSTITUTIONS

While the utilization by applied sciences and technologies of the discoveries of pure research may be left to commercial enterprise, such research depends upon educational institutions in two directions. First, pure research projects must be fostered, in the main, by these institutions. Secondly, a capable research personnel must be trained for recruiting the ranks both of commercial and of educational investigators. The place of the university in the first of these functions, in relation to the natural sciences, was emphasized in the discussions before the American Chemical Society Institute at Northwestern University in the summer of 1928, and in addresses during the year by such research scholars as Dr. Irving Langmuir and Professor R. A. Millikan. Only the exceptionally well-financed and broadly administered research laboratory in private industry can undertake the investigations, often long-continued and not immediately remunerative, required for the advancement of pure science. Moreover, proprietary rights arise when such discoveries are made by commercial laboratories. Research in the humanities and the social sciences is fostered in even greater relative measure by educational agencies. There is substantial unanimity of opinion, therefore, in upholding the view that the future of pure research is bound up with that of educational institutions.

ENCOURAGING RESEARCH IN EDUCATIONAL INSTITUTIONS

Methods.—Among American institutions of higher education the time-honored method of promoting research has been through the efforts of their teaching staffs—usually inadequately supported and burdened by instructional duties—on the one hand, and the work of graduate students on the other. Aside from research fellowships available at all of the leading institutions for some students in candidacy for the doctorate, fellowships and grants in aid of research thus conducted are awarded by such organizations as the National Research Council, the Social Science Research Council, the Commonwealth Fund, and others. The Commonwealth Fund awarded fellowships to 23 honor graduates of British institutions for study and research in American universities. A "project for study and research" was undertaken by each of these fellows.

Research by scholars whose duties are primarily instructional, and by graduate students, has, however, limitations in relation to the more fundamental undertakings which require intense and long-continued application and marked perfection of technique. Methods of affording more effective encouragement to investigators have been evolved in two directions: namely, through grants for financing research projects; and through provision for organized research in special institutions.

Grants For Specific Projects.—Several universities possess funds from which grants are made to members of their staffs to enable them to carry forward specific projects of research. Harvard University utilizes in this manner the income from the Milton Fund, which is about $50,000 annually. In October, the Heckscher Foundation for Research at Cornell University announced a grant of $70,294 for 42 research projects. Of this sum, $34,550 was appropriated to aid members of the Cornell faculty in research in projects concentrated on the single field of radiation. The program outlined consisted of nine major projects, each concerning itself with radiant energy of a particular wave length. The sum remaining from the grant was assigned to other members of the staff for the prosecution of research projects in varied fields.

Fellowships.—A service of somewhat similar character is being performed by research fellowships at several of the leading universities, available only to holders of the doctorate or equivalent preparation. Yale University announced in May the award of 35 fellowships of this character. Similar appointments are also provided by a number of councils and foundations. The Social Science Research Council announced in April the award of 21 research fellowships for scholars engaged in research projects and 8 grants in aid of such undertakings. The same organization also established, early in the year, a new series of research fellowships in agricultural economics and rural sociology for the five-year period 1928-33; and set aside a fund of $150,000 for this purpose. Eighteen fellows were appointed for 1928-29. The American Council of Learned Societies awarded in April grants to 20 American scholars in aid of research projects in archæology, biography, economics, history, literature, and political science.

ADVANCED RESEARCH

Organized Guidance.—The increasing scope and complexity of research undertakings serve to emphasize the need of organized guidance in research beyond the graduate school. The year 1928 witnessed the development of such a research institution and training center at Washington, D. C., through the amalgamation of the Institute of Economics, the Institute for Government Research, and the Robert Brookings Graduate School of Economics and Government, the new institution being designated as the Brookings Institution. It will include specialized research institutes in the fields represented by its component bodies, and will carry out comprehensive and interrelated research programs, particularly in fields basic to applications to public affairs. It will be designed to afford to those who have attained the proficiency in research represented by the doctorate, an extension of the period of research training and research opportunity.

Junior and Senior Levels in the Graduate School.—Discussion during the year served to emphasize further the divergency between levels in graduate instruction. President Lowell of Harvard University, for example, discussed the requirement of the degree of Master of Arts as a prerequisite to many appointments in public school systems. He pointed out that through the further requirement of courses credited toward this degree as a condition for promotion therein, the graduate schools of universities are virtually compelled to extend the college level and the college system of point credits to courses leading to the A.M. Hence this degree tends in its standards to approximate more nearly the senior college level than the university level. The work of the university level proper should emphasize scholarship and research rather than sharply differentiated courses. Both types of service are of public benefit, but they are fundamentally distinct and are not necessarily carried on in the same school. A separation, in his view, would be advantageous to both. This was the original plan of Johns Hopkins University.

OUTSTANDING EVENTS

The Carnegie Institute of Technology, in coöperation with the U. S. Bureau of Mines and advisory boards of mining and metallurgical engineers and executives, undertook during the year fourteen projects in basic research designed to furnish conclusions applicable to the improvement of coal mining and metallurgy. For carrying out these projects, appointments of a research engineer, an assistant engineer, an analyst, and eleven research fellows were made.

Rural Research at Columbia.—Columbia University announced in April the projected establishment of a research institute on rural affairs to coördinate and carry forward the work of research in fields applicable to the economic, political, and social problems connected with rural life.

Sociological Research at New York University.—The School of Education, New York University, was

the recipient of a gift for carrying out a research project extending over three years in the sociological aspects of boys' clubs. Eight fellowships were created for this purpose.

Source Material for Southern History.—The activities of research students in Southern history have been handicapped by the lack of collections of sources. An effort to supply this need was undertaken during the year by the University of North Carolina. The plan contemplates the assembling of records dealing with the history of the Southern States from the colonial settlements to the present time. The material being sought includes family records, diaries, account books, memoranda, and general writings throwing light upon the history of these states.

University of Virginia Trust Fund.—A trust fund of between $5,000,000 and $6,000,000 was established by an anonymous donor at the University of Virginia. Of the income from this fund, one-half will be used for the maintenance of fellowships and scholarships.

SELECT REFERENCES

BUTLER, F. H. C.—"The Research Spirit in Education" (*Educational Review*, vol. 75, pp. 195-198, April, 1928).

CATLIN, G. E. G.—"American Research Foundations" (*Contemporary Review*, vol. 132, pp. 477-481, October, 1927).

EATON, T. H.—"Research and the Training of the Researcher" (*Science*, n.s., vol. 67, pp. 619-620, June 22, 1928).

HOLMES, H. N.—"The Place of Research in the College" (*Science*, n.s., vol. 67, pp. 539-543, June 1, 1928).

HUDELSON, Earl (editor).—*Problems of College Education* (Minneapolis, Minn., University of Minnesota Press, 1928). Comprises studies in administration, curriculum, instruction, and student personnel. Has chapters dealing with educational research and the functions of the graduate school.

LASKI, H. J.—"Foundations, Universities, and Research" (*Harpers Magazine*, vol. 157, pp. 295-303, August, 1928).

LOEB, L. B., COMPTON, K. T., and BIRGE, R. T.—" 'Centers of Research,' A Reply" (*Science*, n.s., vol. 68, pp. 202-3, Aug. 31, 1928).

LOWELL, A. Lawrence.—"The College and the Graduate School" (*Educational Record*, vol. 9, pp. 3-8, January, 1928).

MARTIN, G. W.—"Centers of Research" (*Science*, n.s., vol. 68, p. 300, Sept. 28, 1928).

METCALF, M. M.—"Research in Colleges" (American Association of University Professors, *Bulletin*, vol. 14, pp. 277-279, April, 1928).

OGG, Frederic Austin.—*Research in the Humanistic and Social Sciences* (New York, The Century Company, 1928). Comprehensive study of existing research agencies and activities, facilities, projects in progress or in prospect, and surrounding conditions.

PELTIER, George L.—"A Research Delusion" (*Science*, n.s., vol. 68, pp. 192-193, August 31, 1928).

WILLIAMS, S. R.—"Centers of Research" (*Science*, n.s., vol. 68, p. 61, July 20, 1928).

WORKS, George Allan.—*College and University Library Problems* (Chicago, American Library Association, 1927). Chapter III discusses coöperation in the development of library resources for research.

EDUCATIONAL MISCELLANIES

By Thomas E. Finegan

President, Eastman Teaching Films, Inc.
and
Clarence Linton

Secretary, Teachers College, Columbia University

MOTION PICTURES IN CLASSROOM INSTRUCTION

Experiment.—In September, 1926, the Eastman Kodak Company began an experiment to determine the value of motion pictures as an aid to teachers in their regular daily classroom work. The general plan was approved by the National Education Association at its meeting in Philadelphia in July of that year. The films used in the experiment were named classroom films. This name has special significance. A classroom film is one to be used by a teacher, when needed, in the same way that other classroom aids or apparatus are used. This type of film is distinguished from an auditorium film.

Scenarios.—The first step in the experiment was to prepare the films. Each film is based upon a scenario. It was vital, therefore, that scenarios should be prepared upon a sound philosophy. Practical teachers of long experience and known achievement were selected to write the scenarios. These teachers were aided by supervisors and other experts in education. The scenarios were correlated with the curriculums representative of the country at large. Only the basic features essential to a fundamental knowledge of the subject were included. Material presented was within the intellectual range of the children for whose instruction they were made. The modern psychology of childhood was taken fully into account. The approach to and presentation of the topics was made to conform to generally accepted classroom practices.

Twelve cities were chosen for experimentation with the use of films. These cities were:

Atlanta, Ga.	Denver, Col.
Chicago, Ill.	Detroit, Mich.
Kansas City, Mo.	Oakland, Calif.
Lincoln, Neb.	Rochester, N. Y.
Newton, Mass.	San Diego, Calif.
New York, N. Y.	Winston-Salem, N. C.

Selection of Teachers and Pupils.—Dr. Ben D. Wood of Columbia University and Dr. Frank N. Freeman of the University of Chicago were selected to plan and supervise the experiment. Children of the same intellectual levels were selected for the control and the experimental groups. Teachers of equal qualifications and of the same teaching ability, so far as it is possible to measure these qualities, were selected.

Groups and Courses.—Approximately 11,000 pupils participated in the experiment, there being 5500 in each group. Two subjects were chosen, —geography in the sixth grade and general science in the first or second year junior high school. A course of study covering a period of ten weeks was organized. The course for each group was identical. The control group could not use motion pictures but such group could use still pictures and such other aids as the teacher might desire.

Tests and Results.—The pupils were given a test at the beginning of the experiment and the same test at the close. Five intermediate tests were conducted. The papers were rated under the direction of Dr. Wood in the research bureau of Teachers College, Columbia University, and under the direction of Dr. Freeman in the School of Education, the University of Chicago. Their report shows that the 5500 pupils taught with the aid of films in geography gained 33 per cent more than the pupils instructed without the use of films and that in general science the experimental or film group gained 15 per cent over the corresponding

group which did not have the use of films. The report further showed that the films were effective in arousing and sustaining greater interest on the part of the children: in improving the quantity and quality of their reading; in stimulating their self-activity and originality; in developing their desire and ability to discuss subjects and to write about them; in increasing the richness, accuracy and meaningfulness of experience and imagery; and in aiding them to correlate the features of the lessons with personal experiences and community conditions.

NATIONAL CONFERENCE ON EDUCATION

Installation of Dean Russell.—A national conference on education was held at Teachers College, Columbia University, on the occasion of the installation of William Fletcher Russell, Ph.D., LL.D., as Dean of Teachers College on April 10 and 11, 1928. Prominent educators of the United States and several foreign countries participated in the conference.

On the afternoon of April 10 an academic procession formed in Dodge Hall, marched through Russell Hall, and by 120th Street to the Horace Mann Auditorium. Cleveland E. Dodge, Vice-Chairman of the Board of Trustees of Teachers College, gave the opening address. The installation address was given by Nicholas Murray Butler, President of Columbia University, which was followed by the response of Dean Russell and an address by John Dewey, Professor of Philosophy of Columbia University.

Themes and Addresses.—The theme of the first general session of the conference was "Some Contributions of American Education" as seen by Peter Petersen, Professor of Education, University of Jena; Albert Feuillerat, Professor of English literature, University of Rennes; and Rafael Ramirez, Minister of Rural Education, Republic of Mexico. Speakers for the second general session were Howell Cheney, of Cheney Brothers; Everett Dean Martin, Director of People's Institute; and Henry Fairfield Osborn, President of the American Association for the Advancement of Science, and Chairman of the Board of Trustees of the American Museum of Natural History, who discussed "Some Shortcomings of American Education." The third general session was devoted to a consideration of the "Responsibilities of Higher Educational Institutions for the Development of American Education." The speakers were Lotus B. Coffman, President of the University of Minnesota; Annie W. Goodrich, Dean of the School of Nursing, Yale University; and George W. Frasier, President of the Colorado State Teachers College.

Group Conferences.—Twenty-six group conferences were held on the afternoon of April 11 to consider problems in the various fields of professional education. Prominent educators from all parts of the country took part in these discussions.

Ball and Pageant.—Dean and Mrs. Russell entertained the students and officers of the College and their families at a ball and dinner on the night of April 10. A pageant depicting the evolution of American life and education was given in the Thompson Gymnasium preceding the ball.

Trustees' Dinner.—The conclusion of the conference was marked by a dinner to the fourteen hundred officers and guests of the College given on the night of April 11 at the Hotel Pennsylvania by the Trustees of Teachers College. Frank R. Chambers, Trustee of Teachers College, was toastmaster. The speakers on this occasion were Nicholas Murray Butler, President of Columbia University; John H. Finley, of the *New York Times;* Frederick P. Keppel, President of Carnegie Corporation; Bruce R. Payne, President of George Peabody College for Teachers; John J. Tigert, Federal Commissioner of Education; and Dean William Fletcher Russell.

A number of the more important addresses and reports of the discussion groups were published in the *Teachers College Record* for 1928-29.

COGNATE SOCIETIES

GENERAL

American Association for Adult Education.—41 E. 42nd St., New York, N. Y.

American Association for the Advancement of Science.—Smithsonian Institution, Washington, D. C.

American Civic Association.—901 Union Trust Building, Washington, D. C.

American Council of Learned Societies.—907 15th St., Washington, D. C.

American Council on Education.—26 Jackson Place, Washington, D. C.

American Education Association.—522 Fifth Ave.

American Federation of Teachers.—327 So. La Salle St., Chicago, Illinois.

American University Union.—Columbia University, New York, N. Y.

General Education Board.—61 Broadway, New York, N. Y.

National Association of Directors of Educational Research.—University of Michigan, Ann Arbor, Mich.

National Congress of Mothers and Parent-Teacher Associations.—1201 16th St., N. W., Washington, D. C.

National Education Association.—Department of Superintendence.

National Education Association of the United States.—1201 16th St., N. W., Washington, D. C.

National Council of Education.—200 New Jersey Ave., N. W., Washington, D. C.

National Home and School Association, Inc.—17 E. 42nd St., New York, N. Y.

National Research Council.—Division of Education Relations.

National Society for the Study of Education.—10 Putnam St., Danvers, Mass.

Public Education Association.—8 W. 40th St., New York City, N. Y.

INTERNATIONAL

Alumni Association of American Rhodes Scholars.—305 Congress St., Boston, Mass.

International Council for the Education of Exceptional Children.

International Council of Religious Education.—381 Fourth Ave., New York, N. Y.

International Educational Association.—80 E. 11th St., New York, N. Y.

International Kindergarten Union.—1201 16th St., N. W., Washington, D. C.

International Lyceum and Chautauqua Association.—431 S. Wabash Ave., Chicago, Ill.

Institute of International Education.—2 W. 45th St., New York, N. Y.

League of Nations Committee on Intellectual Cooperation.—Geneva, Switzerland.

Pan American Educational Congress.—Universidad de Chile, Santiago, Chile.

TEACHERS

American Federation of Teachers.—327 So. La Salle St., Chicago, Ill.

Educators' Association.—303 Fifth Ave., New York, N. Y.

Head Masters' Association.—241 W. 77th St., New York, N. Y.

National Association of Teachers' Agencies.—36 Pearl St., Hartford, Conn.

National Student Forum.—2929 Broadway, New York, N. Y.

Students' Co-operative Society.—565 Fifth Ave., New York, N. Y.

Teachers' Council.—500 Park Ave., New York, N. Y.

Teachers' Union.—70 Fifth Ave., New York, N. Y.

SCHOOLS

American School Citizenship League.—405 Marlborough St., Boston, Mass.

Federation for Child Study.—242 W. 76th St., New York, N. Y.

NATIONAL ASSOCIATION OF HIGH SCHOOL SUPERVISORS AND INSPECTORS.—1016 Michigan Ave., Ann Arbor, Mich.

NATIONAL ASSOCIATION OF SECONDARY SCHOOL PRINCIPALS.

NATIONAL KINDERGARTEN ASSOCIATION.—8 W. 40th St., New York, N. Y.

Y. M. C. A. EDUCATIONAL SECRETARIES ASSOCIATION.—55 Hanson Place, Brooklyn, N. Y.

COLLEGES AND UNIVERSITIES

AMERICAN ASSOCIATION OF COLLEGIATE REGISTRARS.—Mich. State Normal College.

AMERICAN ASSOCIATION OF JUNIOR COLLEGES.—Central College, Conway, Ark.

AMERICAN ASSOCIATION OF UNIVERSITY PROFESSORS.—Charles River Road, Cambridge, Mass.

AMERICAN SOCIETY FOR THE EXTENSION OF UNIVERSITY TEACHING.—925 Chestnut St., Philadelphia, Pa.

AMERICAN UNIVERSITY UNION.—2 W. 45th St., New York, N. Y.

ASSOCIATION OF AMERICAN COLLEGES.—111 Fifth Ave., New York, N. Y.

ASSOCIATION OF AMERICAN UNIVERSITIES.—Harvard University, Cambridge, Mass.

ASSOCIATION OF COLLEGES FOR NEGRO YOUTH.—Shaw University, Charlotte, N. C.

ASSOCIATION OF LAND GRANT COLLEGES.—Iowa State College, Ames, Iowa.

ASSOCIATION OF URBAN UNIVERSITIES.—College of the City of New York, New York, N. Y.

COLLEGE ENTRANCE EXAMINATION BOARD.—431 W. 117th St., New York, N. Y.

NATIONAL ASSOCIATION OF COLLEGES AND UNIVERSITIES.—Atlanta, Ga.

NATIONAL ASSOCIATION OF STATE UNIVERSITIES IN THE U. S.—University of Illinois, Urbana, Ill.

NATIONAL UNIVERSITY EXTENSION ASSOCIATION.—267 State House, Boston, Mass.

NATIONAL UNIVERSITY EXTENSION ASSOCIATION.—Department of Education, State House, Boston, Mass.

NEW ENGLAND ASSOCIATION OF COLLEGES AND SECONDARY SCHOOLS.—Wellesley College, Wellesley, Mass.

PHI BETA KAPPA.—145 W. 55th St., New York, N. Y.

PROFESSIONAL EDUCATION

AMERICAN BAR ASSOCIATION.—Section of Legal Education.—209 S. La Salle St., Chicago, Ill.

AMERICAN MEDICAL ASSOCIATION.—Council on Medical Education and Hospitals, 535 N. Dearborn St., Chicago, Ill.

ASSOCIATION OF AMERICAN LAW SCHOOLS.—102 Law Building, Iowa City, Iowa.

ASSOCIATION OF AMERICAN MEDICAL COLLEGES.—25 E. Washington St., Chicago, Ill.

ASSOCIATION OF AMERICAN LAW SCHOOLS.—62 Law School, Harvard University.

SPECIAL EDUCATION

AMERICAN ASSOCIATION TO PROMOTE TEACHING OF SPEECH TO THE DEAF.—1601 35th St., N. W., Washington, D. C

AMERICAN CHILD HEALTH ASSOCIATION.—370 Seventh Ave., New York, N. Y.

AMERICAN HUMANE EDUCATION SOCIETY.—180 Longwood Ave., Boston, Mass.

AMERICAN PHYSICAL EDUCATIONAL ASSOCIATION.—Highland Station, Springfield, Mass.

NATIONAL ASSOCIATION OF THE DEAF.—School for the Deaf, Trenton, N. J.

VOCATIONAL

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF AGRICULTURAL TEACHING.

AMERICAN HOME ECONOMICS ASSOCIATION.—617 Mills Bldg., Washington, D. C.

AMERICAN PHYSICAL EDUCATION ASSOCIATION.—820 State St., Springfield, Mass.

BUREAU OF AMERICAN WORKERS' EDUCATION.—416 W. 24th St., New York, N. Y.

NATIONAL SOCIETY OF VOCATIONAL EDUCATION.—Department of Public Instruction, Harrisburg, Pa.

National Vocation Guidance Association. — Harvard University, Cambridge, Mass.

New England Home Economics Association.—41 Eliot Memorial Road, Newtonville, Mass.

Trade Union Education League.—108 E. 14th St., New York City, N. Y.

Vocational Education Association of the Middle West.—John N. Greer, Minneapolis, Minn.

INDEX

ABBEY, EDWIN AUSTIN, 809
Accidental death benefits, 359
Accidents, increase of, 366
Accord, Anglo-French, 70
Act, anti-deficiency, 182
  California Corporate Securities, 339
  Civilian Vocational Rehabilitation, 858, 859
  Clayton Anti-Trust, 344
  Cotton Futures, 335-338
  Federal Longshoremen's, 536
  Federal Reserve, 345
  Flexible Tariff, 22
  Grain Futures, 336
  Immigration, 1924, 482
  Johnson Quota, 472, 477, 478
  Martin, 338
  Merchant Marine, 24, 25, 618, 619, 624
  National Vocational Education, 851, 853, 855, 857, 859, 861
  Radio, 1927, 23
  Railroad Labor, 531, 532
  Revenue, 175, 176, 202, 207, 360
  Sheppard-Towner Maternity, 528, 538
  United States Warehouse, 639
  Wilson Tariff, 329
Adams, Thomas S., 75, 135
  Walter S., 572, 573
Adjusted Compensation Act, World War, 272
Administration Service, Federal, 90
Adnec, 631
Adrian, physiological work, 723, 724
Adult Agricultural Education, 853, 854
  Education, 779, 800, 861-864
    Bibliography on, 864
    Schools, rural, 862
    Urban communities, 863
    Vocational, 851
Aernautical Board, 458
Aeronautics, education in, 838
  Government, 456
  Naval, 301, 405
Aerodynamics, 452
Aerology, weather service for flying, 660
Aeroplanes, 316
  Engines of, 596
Afghanistan, 67
  King and Queen of, 67
Africa, expedition to, 673, 675
  Produces coffee, 406
  Yellow fever studies in, 727, 732, 739
Agencies, vocational educational, 854, 255
Agnew, P. G., 637
Agricultural chemistry, 683
  Education, 853, 854
  Exports, 373
  Legislation, 375-977
  Meteorology, 663
  Products
    Imports under Tariff Commission, 426
  Waste
    Utilization of, 69
Agriculture, 14
  Conditions of, 369
  Department of
    Officers of, 93, 94
  Deterioration of waste, 685
  Period of depression, 666
  Revenue from, 369
  Secretary of, 639, 856
  Standardization of, 639
Air Commerce Act, 213, 455
  Corps, 256, 278
  United States Army, 454
  Mail Service, 455
  Navigation
    Maps, 213
    Routes, 454
  Transport, world statistics on, 643
Aircraft products, manufacture of, 466
  Registration, 452
Airplane engines, air-cooled, 453
  Oil, 453
  Technique, 451-458
  Types of, 302
    Biplane, 452
    Monoplane, 452
Airports, 454, 642
Aishton, R. H., 434
Akron, 141
Alabama, legislation, 120, 121, 538
  Novels of, 779
  Racial legislation, 472
  Vocational education in, 859
Alaska, 146, 147, 148, 480
  Agricultural College and School of Mines, 147
  Aviation in, 148
  Culture of Eskimo, 763
  Earthquakes, 654
  Economic conditions, 146, 147
  Education, 147
  Fisheries, 392
  Fur seals, 394
  Gold yield, 409
  Mining, 147
  Road Commission, 148
  Transportation, 147
Albig, W. Espey, 352
Alden, Carroll S., 304
Alfalfa Weevil, 388
Aliens, Chinese, 473, 474
  Deportation of, 474, 477, 478
  Status of, 473-476, 480, 481
Allen, Charles R., 848
Alloys, developments in, 630-632
Almack, Malcolm D., 34
Almeda, importance as port, 245
Alpha cellulose, used by rayon industry, 692
Aluminum, prevention of corrosion, 689
  Use of, 687
Amendment, Fourteenth, 206 479
  Eighteenth, 27, 28
  Davis, 23
  Lame Duck, 10
  Platt, 61
  Wisconsin, 133, 134
Amendments, State Constitutional, 36
American Association for Adult Education, 863-864
  Bankers, 206, 342, 343, 344, 352, 354
  Bar, 328, 340, 843
  Of Dental Schools, 737, 738
  Economic Entomologists, 718
  Of Law Libraries, 801
  Philosophical, 750
  Prison, 495
  Of Psychiatric Social Workers, 507
  Psychological, 751
  Public Health, 740, 741
  Social Hygiene, 501, 502
  Standards, 609, 637, 638, 640, 641
  Of Variable Star Observers, 576
  Water Works, 245
Bridge Company, 587
Chemical Society, 686
Council of Learned Societies, 760
Composers, 820, 821
Correspondence School of Librarianship, 800
Engineering Council, 605
Explorations, 671
Federation of Labor, 521, 523, 525-527, 534, 859-861
Fiction, 776-781
Foundation for Mental Hygiene, 504
Geophysical Union, 662
Influence
  Spheres of, 164
Institute of Electrical Engineers, 607
  Law, 843
  Of Mining and Metallurgical Engineers, 328
Library Association, 799, 800, 801
  Institute, 801

American Marine Insurance Syndicate, 364
Mathematical Society, 566-571
Medical Association, 729, 843
Meteorological Society, 661, 662
Physical Society, 569
Welding, 587
Poetry, 781-784
Samoa, 158, 161
Society of Civil Engineers, 590
Of Pharmacology, 733
Sociological, 759
Telephone and Telegraph Company, 610
Amundson, Roald, 671
Analysis situs, 567
Anatomy, 701, 711
Andover, Phillips, Academy, 808
Andrews, John B., 529, 535
Roy Chapman, 764
Anemia, Cooper Treatment of, 734
Anglican Church Relation with Parliament, 543
Anglo-Catholic activities, 546
Anglo-French Accord, 70, 75
Animals, diseases and pests, 386
Ann Arbor, 733
Anthropology
Discoveries in, 762
Physical, 761
Studies in, 762
Anti-deficiency Act, 182
Anti-Saloon League, 27, 29
Apiculture, 721
Appell, George C., 498
Appropriation Act for Reclamation, 220
Arabia, 66
Literature on, 798
Arbitration and Conciliation, Conference of, 59
Arch Dam Investigation, 590
Archæological discovery, 763, 804
Architecture, 814, 815
History of American, 772
Literature on, 815
Naval, 618-623
New church buildings, 814
Arctic explorations by air, 671
Argentine, 67, 68, 320, 322, 576, 577
Attitude towards United States, 19, 60
Collections in, 709
Exports of flaxseed and linseed oil, 427
Hoover trip to, 59
Mineral finds, 659
Money rates, 357
Arizona
Culture of cliff dwellers, 763
Ore deposits of, 217
Paleontological studies, 215
Arkansas, corporation taxes, 205
Legislation, 119
Report on oil and gas, 216
Report on sandstone, 218
Arkansas
Tax assessment, 199
Water resources, 219
Arlington Bridge, 586
Armenia, 186
of Offices, 295
Army and Navy, Joint Board
Industrial College, 259
Medical Schools, 263
Organization of, 272
Personnel, 256
Accomplishments of, 277-286
Fluctuations in, 258
School System, 259
Art in education, 808
Artichoke, use in diabetes, 686
Artillery School, Coast, 262
Field, 262
Asheville, Ga., zoning legislation, 201
Asia
Archæological expeditions, 744
Association of American Colleges, 840
American Law Schools, 843
American Medical Colleges, 843
Colleges and Secondary Schools of the Southern States, 800
Community Chests, 499
Astoria, Oregon, financial fraction, 244
Astronomical Society of the Pacific, 573
Astronomy, 571-579
Bibliography, 579
Comets, 576, 578
Corona, 575
Meteors, 576
Neptune, 575
Personnel notes, 572, 573
Solar spectrum, 574
Stars, 576, 578
Sun, 573, 574
Velocities, 577
Athens, excavations in, 806
Atherton, Gertrude, 777
Atkinson, J. Brooks, 823
Atlanta, Assembly of Presbyterian Church, 556
Attorney's Office, United States, 108
Austin, Leonard S., 405
Australia, 52, 574
Labor party, 515
"White," 79, 80
Austria, 1, 86
Commercial treaty with, 323
Socialist party, 516
Automobile industry, 330
Insurance, 365
Market, 315, 321
Tax, 208-210
Automobiles, 610, 611
Axle development, 516
Brake improvement, 516
Clutch developments of, 615
Construction, 432
Design changes, 618
Equipment changes, 516, 517
Fuel system and manifolding, 615
Automobiles, Motor control, 612, 613
Production of, 420, 465
Sees pension improvements, 617
Tire developments, 516, 517
Transmission developments, 615
Wheels developments, 516, 517
Automotive engineering, 614-618
Aviation, air mail, 641, 642
Commercial, 641-644
Fields, 227
Insurance, 360
Passenger service, 641, 642
Private, 642
Schools, 265
Service, 295
Technical developments in, 641
World records in, 644

BABSON Reports, 307-310, 312, 313, 319
Bach Festival, 822
Bacterial wilt, 717
Badi, W. F., 804
Bailey, Beulah, 196
Catherine Smith, 815
Bain, Peter, 298, 477
Baker, Newton D., 495
Balance of Trade, 320
Baldwin, Stanley, 28, 55
Baltimore, 141
and Ohio Railroad, 608
Shipping, 243
Bank failures, 354
Gold reserves, 342
National City, 308, 309
Savings deposits, 342
Tax, 205
Banking and Currency Committee, 345
Banks and Trust Companies, 350-355
National and state, 341-344
Savings, 350
Baptist convention, Northern, In Detroit, 548, 549
Southern, 549
World Alliance, Congress, 548
Barco Concession, 62
Barley, 380, 382
Barnes, Harry E., 497
Bartholomew, Harland, 139
Barton, George A., 797
Bauer, John, 230
Baugh, Albert C., 785
Bay Mobil, value as port, 244
Beacon lighting, 610
Beard, Charles A., 132
Beales, Le Verne, 464
Belgium, 52, 64, 69, 186, 322
Convention, 50
Output of plate glass, 426
Belles Lettres, 784-785
Bibliography of, 784-785
Beloit College, Logan Museum, 809
Benet, Stephen Vincent, 782, 783
Benzene derivatives, 683

Bermel, Joseph, 129
Beryllum, 631, 687
Better Wheat Conference, 915
Bibliographical Society of America, 801
Biography, American, 772-775
  Bibliography of, 772-775
  English, 787
  Foreign, 775
Bibliography, Library work in, 800
  Pathological, 728
Bill, Boulder Dam, 605
  Deficiency, 180
  Jones-White, 24, 25, 618, 619, 624
  McNary-Haugen, 2, 9, 27
Bill, Massachusetts Utilities, 605
  Muscle Shoals, 605
  Naval Cruiser, 55, 618
  Parker, 741
  Rogers, 45
  Tax Reduction, 180
Bills of Exchange, 345
Bios, used in yeast cells, 682
Birth rates, 742
Black, Archibald, 641
Blackmer, Harry M., 110
Blake, Henry W., 444
Bless, G. A., 567
Bloch, Ernest, 820
Board of American Missions, 552
  of Surveys and Maps, chart making, 457
  Shipping, 24, 25
Boilers, 592, 593
Bok, Edward, 814
Bok's Bell Tower, 814
Boldyreff, digestive theory of, 724
Bolivia, 68, 71
  Dispute with Paraguay, 59, 19, 73, 74
Bond market, 312, 313
Book Collecting, 785
  of the Month Clubs, 782
Booth, Bramwell, 557
Border patrol, 475, 478
Bonij, E. G., 752
Boston, 135, 138
  Elevated Railway, 200, 235, 446
  Museum of fine Arts, 807
  Orchestra, 820
  Shipping Center, 242
Botanical Societies, 911
Botany, 711
  economic, 715
  Publications on, 714, 715
Boulder Dam, 13, 15
  Bill, 605
Bradstreet's Index, 309, 310
Brainerd, T. Greist, 602
Braithwaite, William S., 781
Brantiny, George, 517
Brazil, 322
  Coffee industry, 329
Briand, Aristide, 17, 19, 28, 73, 74
Brick, building, 633, 634
British colonies, 328, 331
  Gold and Silver output, 411
  Empire, tariff revisions of, 333, 334
  "Monroe Doctrine," 52
Broadway Methodist Temple, 554
Brockman, C. J., 689
Brokers' Loans, 348
Broomfield, Louis, 777
Bronx Borough, importance as terminal, 243
Brookings Institution, 132
Brooklyn Corporation ownership of apartments, 509
  Waterfront facilities, 243
Brookwood College, 527
Brown, Hugh A., 219
  Robert M., 671
Browne, C. A., 683
Bruce, Senator, 29
Brummer Galleries, 813
Bruns, Friedrich, 789
Buck, Arthur E., 176
Budget Estimates, 16
  Execution of, 181, 182
  Legislators, 178-180
  National, 176, 177-182
Budgets, State, 191-192
Buell, Raymond L., 67
Buffalo, 132
  Grain center, 241
Bulgaria, Socialist party, 517
Bureau, Aeronautics, 293, 301
  Agricultural Economics, Airplane observation, 457
  Budget, Navy Appropriations, 294
  Census, 188, 456, 464, 483, 741
  Chemistry and soils, 213, 214
  Construction, 293
  Education, 146, 839
  Efficiency, 99
    Chief of, 100
  Engineering, 293
  Entomology, use of airplanes, 457
  Fisheries, 456
  Foreign and Domestic Commerce, 456
  Indian Affairs, 224, 225
  Labor, 529, 530, 533, 536
  Lighthouse, 456
  Medicine and Surgery, 293
  Mines, 409, 456, 630
  Naturalization 480, 482
  Navigation, 292
  Ordnance, 293
  Public Roads, 213, 580
  Reclamation, 220
    Construction achievements, 221
    Legislation, 224
  Revenue,
    Members, 104
  Standards, 456, 572, 574, 632, 633, 637, 640
  Supplies and Accounts, 293
  Yards and Docks, 293
Bush, A. L., 432
Business, education for, 846, 847
  Failures, 309
  Improvement, 308
  Organization of the Government, 174, 176, 177
Buttenheis, Harold S., 137
Butts, Allison, 415
Byrd Aerological Equipment, 661
  Antarctic Expedition, 662, 675

CADMAN, S. PARKES, 542
  Cadimium plating, costs of, 688
Caesium, value of, 676
Calculus of Variations, 566, 567
California, bank tax legislation, 206, 207
  Civil service, 105
  Corporate Securities Act, 339
  Corporation tax, 205
  Financial taxes, 196, 197
  Fiscal reform, 126
  Gold yield, 410
  Institute of Technology, 571
  Judiciary, 124
  Legislation, 119, 120, 139, 140
  Motion pictures, 109
  Oil industry, 328, 404
  Railroad assessment, 199
  Securities legislation, 339
  Taxpayers Association, 191, 201
Callander, W. F., 377
Calles, President, 18, 28
Calles, President of Mexico and oil settlement, 60
Camden, water transportation, 243
Cammen, Leon, 591
Camp, Ernest W., 423
Camphor, 735
Canada, 32, 52
  earthquakes, 655
  gold production, 410
  immigration problems, 473, 475, 476, 477
  markets of, 323
  Topographic Survey, 664
Canal Zone, 480
Cancer, study of problems in, 740
Cane Sugar, decrease in industry, 466
Canvas, pre-election, 4
Captial punishment, 122
Carbohydrates, significance of, 682
Carboloy, 597
Carbon monoxide flame, 678
  synthesis of, 681
Carey Act, 227
Carnegie Endowment, 950
  for International Peace, 571, 801, 802
  Foundation for Advancement of Teaching, 842
  Institute Cruise, 663
  of Technology, 630, 866
  Institution, 571, 577
    International Art Exhibit, 808
Can, Wildon, 748
Carroll, H. K., 540, 543, 544
Carstens, C. C., 510
Cartography, 669
Casualty insurance, 365-367
Catholic Church, attacks on, 558

Catholic Press, 559
Theological Education, 845
Year Book, 557
Cattle industry, 382
Cavalry School, 261
Cells, photo-electric, 689
Cement, 632, 633
Census, 472, 477
federal reports, 469
Central Pacific Railroad Co., 199
Ceylon, 331
Chain store taxes, 197
Chalmers, Henry, 331
Chamber music, 821
Chamberlain, Sir Austen, 70
Chang Tso-lin, 63
Chaplin, Charlie, 828
Charleston, freight rates, 244
Check clearings, 317, 318
transactions, 317, 318, 319
Chemical Foundation, 733
Chemicals, prices, 694
Chemistry, agricultural, 683
Industrial, utilization of agricultural waste, 690, 691
Inorganic, 676
Organic synthetic products, 680, 693
Physical, 676
Relation to medicine, 733
Chester, information on Roman life, 806
Chiang Kai-Shek, 63, 64
Chicago, 132, 135, 140
Art exhibit, 809
City Club of, 144
Elections in, 128
Federation of Labor, 525
Housing conditions for Negroes, 508
Labor arbitration, 538
Libraries of, 800
Opera, 817
Orchestra, 818
Plant, water supply treatment, 247
Transit problem, 236
Child labor, 512-514, 528, 529
bibliography, 513
District of Columbia, 153
law, 14
welfare, 510
Childress, A. P., 125
Chile, 322
Ca Molie University of, 572
Hoover trip to, 59
money rates, 357
nitrate industry, 329
Peru controversy, 27, 62
China, 18, 27, 57, 63, 64
Commercial treaty with, 323
Medical studies in, 734
Money rates, 357
Nanking Nationalist Government, 334
National Christian Council, 542
Relations with Japan, 76
Tariff Autonomy Treaties, 63, 331, 334
Treaty with Britain, 63
Chinese aliens, status of, 473, 474
exclusion from schools, 114
Chinese immigration problems, 470, 473, 474
Chlorine, 688
Cholecystokinin, 730
Cholera infantum, 511
Choral music, 823
Chree, Charles, 665
Chromium plating, applications of, 688
Chrysler Building, 583
Church of Canada, United, 546
England, new primate, 546
relations with government, 543
Roman Catholic, 557
United States, census of, 557
Cincinnati, 131
orchestra, 818
Circuit Court of Appeals of United States, members of, 107
Circulatory system, 701, 724, 725
City charters, 134, 135
managers, 132, 133
Civil Service Assembly, Constitution, 100
Officers of, 100, 101
Publications, 101
Commission, 25, 26
Annual report, 97, 98
Federal, 97
Personnel, 26
Philippine Islands, 155
Reform League, 104
State, 105
Civilian Vocational Rehabilitation Act, 858, 859
Clapp, Edward, 806
Clark, Lindley D., 526
Classified Property Taxes, 201
Service, 101, 102, 103, 104
Democratic Stand, 102
Republican Stand, 102
Clayton Anti-Trust Act, 344
Violation of, 21
Cleveland, 135
Citizens League of, 122
Electric railways, 608
Legislation, 138
Orchestra, 819
H. Burdett, 245
Clothing Industry, 315, 522
Clubs, Book of the Month, 782
Per Cent, 173, 181, 182
Coal, 315, 626
Arkansas, 216
Exports, 320, 321
Idaho, 217
Coal industry, 522, 534
Ohio, 217
Operators' Association, 400, 401
Powdered, 592
Prices of, 398
Reorganization in industry, 658
Use of zine chloride, 402
Coast Artillery Corps, 281
And Geodetic Survey, observations, 664
Survey, 212, 214
Codling Moth, Problem of, 720
Coffee industry, 329
Statistics of, 466
Coke, 400
Colleges, 838
Collegiate Education, 839-842
Colloidal particles, molecular weight, 679
Colombia, 62, 322
Lindbergh flight to, 59
Colonial trade preference, 331
Colorado, Gold and Silver output, 410
Grand Canyon engineering, 582
Industrial Commission, 522
Legislation, 119
River Dam, 250, 251
Columbia Medical Centre, 844
University, library courses, 800
Rural research, 866
Commerce, 115
Coastwise, Statistics of, 291
Department of, 642
Offices of, 94
Secretary of, 856
Secretary of, 640
Commercial Aviation, 641-644
Education, 854
Investment Trust, 316
Marine Engineering, 623
Treaties, 323, 332
Commission, Civil Service, 25, 26
Federal Administrative, 20
Radio, 23
Trade, 21
Interstate Commerce, 20
Interstate Commerce, 324
League of Nations, Preparatory Disarmament, 68, 69
North Dakota Tax, 190
Private Manufacture of Arms, 75, 76
State Corporation, 328
Railroad, 328
Tax, 191
Tariff, 22
Committee, Arbitration and Security, 75
Economic Consultative, 75
Commodity movements, 319-320
Communists, 514
Compulsory Automobile Insurance Act of Massachusetts, 365, 366
Concrete, 583, 584, 632, 633
Cone, Edwin F., 411
Conference on Community Welfare, 499
Conciliation and Arbitration, 59
Disarmament, 69
First Codification, 76
Governors' Annual, 122
Havana, 56
Methodist Churches, attitudes toward prohibition, 554
Action on Divorce, 554
Pan-American Arbitration, 19, 28
Sixth International American, 28, 58
Sixth Pan-American, 67
Spanish War Veterans, 61
World Economic, 323, 331
Congo, Africa, Economic advance, 541

Congo Missionary Conference, 540
Conference, significance, 541
Congregational Churches, Union movement, 549, 550
Congress, Apportionment of, 122
Effect of Election on, 7
State apportionment, 117
Congressmen, Vocations of, 84
Conley, Charles E., 138
Connolly, Michael E., 128, 129
Conowingo Plant, hydroelectric power, 253
Constitutional changes, State, 190
Developments of States, 118-120
Law, 111
Constitutions, State, 118-120
Consumer, problem of, 638, 639
Convention for Abolition of Import-Export prohibitions, 331
Houston, 71
International Trade, 323
Root Arbitration, 51
Cook, Arthur E., 473
Coolidge, Calvin, 19, 74, 90, 104
Address at Protestant Episcopal Convention, 545
Address to Business Organization of Government Meeting, 174
Armistice Address, 19, 74
Cuban policy of, 62
Immigration policy of, 472
Message to Congress, 19
Multiple-Dome Dam, 588, 589
Policies of, 15, 176-178, 618, 619
Latin-American Relations, 58
Public health bill veto, 741
Refusal to run, 1, 115
Relation to World Court, 74
Vetoes, 180
Elizabeth Sprague, 821
Cooperative-Group plan, 835
Copper, 405-408
Milling, 400
Smelting, 406, 407
Stock market, 312
Corcoran Gallery, American Art Exhibit, 807, 808
Corinth, Discoveries under theater, 805
Corn, 379-380, 382
Cost schedule, 426
Record crops, 371
Cornell Medical College Association, New York Hospital, 844
Corporation, F. W. Dodge, 308
Taxes, 114, 175, 197, 204, 205
Correspondence Courses, 261
Corten, 731, 732
Costa Rica, 56, 62, 73
Lindbergh Flight to, 59
Costigan, Edward P., 22
Cotton, 335, 336, 373, 382, 391
Change in price, 370
Exports, 320, 321
Futures Act, 335, 336
Inquiry, Senate, 336, 337
Pink boll worm, 920
Predictions, 376
Production by States, 378
Standardization of, 639
County Government, Reform movements of, 124-126
Libraries, 799
Court of Appeals, District of Columbia, 107
Claims, United States, 107
Customs Appeals, United States, 107
International Justice at the Hague, 28
World, 68
Cox, Philip W. L., 837
Crane, Hart, 783
Crawford, Nelson A., 375
Crime Condition in United States, 488
Criminal Law Administration, Demoralized Condition of, 497
Statistics, 131, 132
Crist, Raymond F., 479
Criticism, American, 784-785
Bibliography of American, 784-785
Crop Production, 370, 371
Crops, Grain and Cotton, 377-382
"Cross Roads of the Pacific," 79
Cruiser Bill, 55, 298
Coolidge in, 300
Cuba, 165, 166, 322
Cuba, sugar industry of, 329
War Veterans Convention, 166
Culture, Studies in history of, 784, 785
Cumberland, W. W., 166
Cummingham, Harry F., 814
Curtis, Charles, 2
Cushendun, Lord, 69
Customs, Functions of, 423
Court, United States, 107
Procedure, 424
Regulations, 425
System, 423
Cyclones, 662
Cytology, 702, 713
Czechoslovakia, 52, 186

DAIRY CONGRESSES, 386
Expositions, 385
Products, 372, 391
Cost Schedules, 426
Dairying, 384-386
Dall Island, 147
Dallas, 131
Dalton Plan, 834, 835
Danish Folk high school, 839
Darrow, Karl K., 694
Dawes, Charles, 2, 90
Davis Amendment, 23
Davis, Hallie, 812
Herbert H., 735
James J., 476
William H., 741
Death rates, 741
Debt, National, 183
Retirement, 184, 185
Debts, Municipal, 195
Deficiency Bill, 180
Delaware, income tax, 204
Lackawanna & Western Railroad, 608
Legislation, 120, 121
Dellinger, J. H., 458
Denmark, 64
Shipbuilding, 595
Socialist gain, 517
Denominational activities, Protestant, 544
Dentifrices, 738
Dentistry, 737-739
Education in, 738
Practice of, 738, 739
Research in, 738
Department of Agriculture, 309, 851, 853, 854
Use of Airships, 456
Deportation of Aliens, 474, 477, 478
Department of Commerce, 592, 851
Labor, 481, 531, 532, 537
Airports, 456
Navy, 620, 623
Detroit, 131
Engineering, 580, 581
Garages, 239
Improved transit, 446
Lighting system, 611
Municipal ownership, 236
Northern Baptist Convention, 548, 549
Orchestra, 819
Dewell, Henry D., 584
Dewey, John, 751
Diaz, President, 18, 60
Amnesty Decree, 61
Dictionary of American Biography, 772
Die castings, 631
Diencephalon, 725
Diesel Engines, 324, 594-596, 622, 624, 626, 627
Digestion, organs of, 724
Digestive organs, 904
Dinosaurs, 710
Douchlet Series, 568
Disability insurance, 359
Disarmament Conference, 69
and League of Nations, 75
Diseases of Animals, 386
Plants, 387-389
Distler, Theodore A., 839
District of Columbia, 152-154
Child Labor Law, 511, 512
Engineering work, 255
Fiscal Survey, 99
Labor legislation, 528, 529, 535, 536
Securities legislation, 339
Workmen's Compensation, 366
Vital statistics of, 741
Divorce, data on, 485
Dodds, Harold W., 165
Don, Marcus, 240

Doran, James M., 26, 32, 106
Drama, biography of the, 774
English, 787-788
Dramatic revivals, 827
Drug industry, 330
Law, violations, 490
Dubuque Terminal, 242
Dudley Observatory, 576
Duke University, School of Medicine, 844
Duluth, Volume of tonnage handled, 241
Duncan, G. M., 751
Dunlap, R. W., 386
Dunn, F. Jowell, 728
Dunning, William B., 737
Duodenum, 735
Du Pont, Pierre S., 29
Durand, E. Dana, 75
Durant Prize Plan, 34

EADS BRIDGE, 582
Earthquakes, Disasters, 652
Pacific Coast, 654
Eastern Europe, Violation of rights of Jewish Citizens, 562
Ecology, 713
Economic Botany, 715
Experiments in, 917
Experimental production, 918
Mutations by x-rays, 718
Conditions, 307-311
Geography, 666
Geology, Publications, 656, 657
Ecumenical Methodist Conference, 553
Education, Adult, 799, 861-864
Agricultural, 853, 854
Application of Vocational, 850, 851
Architectural, 815
Art in, 808
Business, 846, 847
Collegiate, 839-842
Committee on Medical, 844
Crippled Children, 511
Criticism of, 839
Curriculum of Collegiate, 840
Secondary, 838
Elementary, 834-837
Elemental school principals, 836
Emotional Aspect of Secondary, 838-839
Engineering, 845, 846
Faculty in Collegiate, 840, 841
Financial problems of, 842
Home Economics, 854
Industrial, 851, 852, 853, 854
Junior institutions, 837
Medical, 843, 844
Military, 259
Ministerial, 844
Miscellanies of, 868-869
National Conference on, 869
Naval, 304
Nursery School, 834
Professional, 842-848
School Supervisors, 836
Secondary, 837-839
Education, Social, 501-504
Student activities, 839
Classification, 835, 836
Responsibility in, 841, 842
Vocational, 848-861
Educational Institutions, Pure research in, 865-867
Tests, 765
Edwards, Frank, 129
Gurden, 341, 350
Egypt, 65, 66, 67
Archaeological findings, 805
Egyptian Grammar, Study of, 798
Eighteenth Amendment, 2, 27, 28
Einstein theory, 569, 574
Einthoven, William, 732
Ekblau, W. Elmer, 656, 666
Election Poll Experiment, 765
Results, 7
Elections, House, 527
1928, Presidential, 1
Senatorial, 527
1928, Statistics of, 6
Electoral Laws, Changes in, 120, 121
Vote, 5
Electric furnaces, 687
Lighting and power, 247
Liners, 65
Electrical Engineering, 602-613
Engineering, illumination, 610, 611
Manufacturing problems of, 603
Research, 612
Transmission, 611
Equipment market, 315
Prospecting, 651
Shipbuilding equipment, 627
Electrochemical Commission, International, 641
Electrochemistry, 686
Organic, 688
Electrolytes, aqueous, 688
Fused, 687
Electromotive theory, 733
Elementary Education, 834
Elements, Study of, 676
Ellis, Kimpton, 105
Elsasser, Albert R., 776, 784
Ely, May L., 861
Embryology, Histogenesis, 703
Organogenesis, 704
Emergency Fleet Corporation, 626
Emerson, Howell, 33, 34
Emotions, study of, 725
Employment, 433, 529-531, 524, 525, 598, 599
Factory, 422
Labor, 309, 311
Railroads, 435
Encyclicals, Issued by Pope, 559
Endocine glands, 702, 704
Engineer School, 262
Engineering, automotive, 614-618
Bridge materials, 583
Building foundations, 586
Buildings, 583, 584
Cantilever and arch bridges, 582
Engineering, Car retarder, 602
Cascade tunnel, 587
Chemical, 690
Commercial Marine, 623
Concrete bridge tests, 590
Concrete construction, 589, 590
Concrete dams, 587
Earthquake resistance, 584
Education, 845
Electrical, 602-613
Finances of, 610
Hydraulic machinery, 596-597
Insulation, 612
Interconnections, 609
Internal combustion, 593-594
Load building in, 603
Machine tools, 597, 598
Marine, 618-623
Materials of, 584, 591-602, 627-637
Mechanical, 591-602
Piers and foundations, 585, 586
Power plant, 591-592
Progress in, 623, 624
Railroad, 601, 602
Research, 589, 596
Standards in, 609
Structural, 580-591
Suspension bridges, 580
Substation switching, 613
Traction developments, 608, 609
Truss bridge, 587
Engineers Corps, 286
Engines, developments in, 614, 615
Diesel, 622, 624, 626, 627
Significance of Antiknock material, 677
Vibration eliminators in, 622
England, 19, 63, 67, 70, 735
Church unions, 547
Mathematical studies in, 567
Shipbuilding, 595
English language, 785-788
Literature, 785-788
Entomology, 718
Publications on, 721
Entomological Society of America, 719
Ephedrine, 734
Epigraphy, 794
Epistemology, 748
Esch, John J., 20
Essay, the literary, 785
Esthonia, Socialists in power, 517
Ethics, 749
Ethnology, 761
Eucharistic Congress, 558
Europe, markets of,
European Corn Borer, 388, 720
Exchange movement, 356
Evans, Waldo, 158
Everett, Ray H., 501
Evolution, 706, 707
Controversy with religion, 701
Mechanism of, 699
Organic, 699
Social, 700

Execution Services, Offices of, 96, 97
Expedition, African, 673
Field museum, 673
National Geographic Society, 674
Paolor Volcano, 674
Explorations, American, 671
Arctic, by Air, 671
Exports and imports, 320, 321
Balance, 430
Electrical goods, 603
Machinery, 647, 648

FAIRBANKS, DOUGLAS, 828
Falconer, Douglas P., 495
Fall-Doheny Case, 110
Fargo, Child health demonstration, 510
Farms, 374, 375
Federal administration, 173, 174
Administrative Commissions, 20
Service, 90
Aid, 173, 188
System, 438
Bank taxes, 206
Bureau of Public Roads, 439
Board, Surveys and Maps, 211
for Vocational Education, 853, 855, 856, 858, 859, 860
Census Reports, 469
Children's Bureau, 538
Civil Service, 97
Council of Churches, 541
Economy, 173, 174
Estate Tax, 175, 176, 207
Excise Tax, 208
Expenditures, 168, 169, 208
Farm Banks, 223
Highway Act, 439
Horticultural Board, 376
Income tax, 202, 203
Indian Schools, 512
Judicial Prosecutions, 108
Land Banks, 354
Legislation, 12
Longshoremen's Act, 535
Oil Conservation Board, 328, 623
Plant Quarantine Board, 376
Power Commission, 612
Surveys by airplane, 457
Radio Commission, 23, 458, 607
Reserve Act, 345
Bank Membership, 349, 350
Board, 345, 346, 530
Policy, 346
Powers, 345
System, 174, 175, 344-350
Revenues, 168-172, 208
Specification Board, 639, 640,
Statistics, Analysis, 172, 173, 179
Surveys and Maps, 211
Trade Commission, 233, 340, 602, 604, 648
Utilities Problems, 605
Vital Statistics, 741, 742
Federal Vocational Education, 855, 858-861
Water Power Act, 252
Federation of National Standardizing Bodies, 640
Felt, G. Porter, 718
Fiction, American, 776-781
Bibliography of American, 776-781
Field Artillery, 281
Films, Silent, 830
Sound, 829
Finance, City, 130, 131
Federal, 168-172
Installment selling, 316, 317
School, 262
Finegan, Thomas E., 868
Fingerprinting, 98
Fink, Colin G., 686
Finland, Socialists in, 517
Fire losses, 142, 363
Prevention, 141-143
School, 142
Fiscal Reform in States, 126
Fisher, Dr., 705
Lewis H., 106
Fisheries, 392-395, 668
Foreign trade, 393
Fishwich, Harry L., 401
Flaxseed, 381
Oil, Production of, 427
Fleet, 294
Air, 303
Fletcher, Henry P., 58, 59
Flexible Tariff Act, 22
Flight, Polish, 672
Transatlantic, 672
Transpacific, 673
Flint, Ralph C., 811
Flood Control, 8, 13, 15
Florida, legislation, 118, 120, 121
Novels of, 779
Storm loss, 363
Flower Observatory, 572
Fluctuations in Army Personnel, 258
Foodstuffs, 320, 321, 330
Ford, Henry, 317
Fordney-Macumber Tariff Act, 111
Foreign Corporation License, 197
Exchange, 355-357
Insurance, 363, 364
Investments, 320
Loans, 430
French Industrial, 17
Markets, 322
Purchases of gold, 431
Relations of United States, studies in, 770
Service, Officers, Salaries, 45
Personnel Board, 46
Reclassification Table, 47
Reorganization, 45
School, 46
Table of Diplomatic Personnel, 48, 49
Stabilization, 355
Trade, 316, 319-323
Trade, commodity character of, 320, 321
Increase, 430
Forest meteorology, 663
Forestry, appropriation for, 14
Fort, Tomlinson, 566
Worth, 140
Foster, Worker's Party, 35
France, 19, 52, 67, 70, 72, 73, 330, 332, 736
Gold standard, 348, 349
Kellogg Peace Pact, 72, 73
Prehistoric archaeology, 764
Socialist party, 516
Stabilization of France, 355, 356
Trade policy of, 332
Frances, Edward, 729
Franco-British Agreement, 55
Freeman, Frank N., 868, 869
French, H. J., 635
Literature, 790-791
Frishmuth, Harriet, 812
Fruit industry, 330
Fuel Economy Committee, 596
Naval, 622, 623, 626
Oil Testing Plant, 623
Pulverized, 623, 626
Fuller, Governor, 122
Furlong, W. R., 158
Futures trading, public control of, 335-338

GABRILOWITCH, OSSIF, 820
Galvanometer, Einthoven String, 732
Ganor, William Addleman, 255, 259, 272, 277
Garrod, Dorothy, 762
Gas, in Arkansas, 216
Gases, Electrochemistry, 689
Gasoline, 403
Tax, 197, 209
Gastro-Enterostomy, 735, 736
Gatewood, Richard D., 626
Geissbuhler, Arnold, 813
General Education Board, 839
Electric Company, 317, 625
Motor Corporation, 316, 317, 357
Geodetic Survey, 212
Geography, economic, 666
Geological processes, 651
Survey, 211, 214
State, 214
Geology, Bibliography, 651
Dynamic and Structural, 650
Economic, 656
Federal research, 657
State Research, 657
Geometry, 567
Geophysical instruments, 650
Georgia, legislation, 119
Racial, 472
Regional planning, 126
German War claims, 364
Germanic languages, 789-790
Literature, 789-790
Germany, 52, 67, 322
Engineering, 596
Exports to, 647, 648
General Electric Company, 602
Machinery industry in, 647, 648
Money rates, 356, 357
Shipbuilding, 595
Socialist party, 515, 516
Surgical methods in, 736
Tariff revision, 332
Gibson, Hugh, 69, 75

Gipsy Moth, 720
Gland Extracts, Pituitary, 729, 730
Glass, Manufacture of, 466
Glazel, Archæological forgeries, 806
Goethe, literature about, 789
Goettingen, Hilbert, 586
Gold, 320, 348, 349, 408-411
Foreign purchase, 431
Harry, 733
Output in United States, 408
Plating, accomplishment, 688
Silver Alloys, 631
Goldenweiser, E. A., 344
Gondra Convertion, 68
Goodrich, Ernest P., 237
Goodwin, Elliott H., 106
Gould-Charles system, 578
Gove, George, 507
Government, Business organization, 174, 181, 182
City-manager and council, 132, 133
Insurance policy, 364
Lines, Sale of, 25
Ownership, Merchant Marine, 447
Governmental Research, 132
Governors' Annual Conference, 122
Election of, 36, 37, 38, 39, 40, 41, 42, 43
Governorship, Term of, 122
Graduate Schools, 866
Grain, 391
Graham, Stephen V., 161
Gram, 335, 336
Futures Act, 336
Gran Chacó, boundary despute, 59
Grand Canyon Bridge, 582
Central Galleries, Exhibits at, 811
Great Britain, 52, 328
Commerce, 299
Exports to, 647
Labor party, 527
Machinery industry in, 647
Ministry of Health, 740
Socialism in, 515
Lakes, Ports, 241
Northern Railway, 587
Greece, 186
Greek Archaeology, literature on, 795
Art, literature on, 795
Classics, translations of, 795-796
History, 796
Language, 796
Literature, 795-797
Bibliography, 795-797
Hand books on, 795
Green, William, 859
Greenberg, David M., 689
Greenman, J. M., 711
Growingen, 578
Gross Receipts taxes, 199, 200, 206
Guam, 158, 180
Guatamala, Expedition to, 674
Lindbergh Flight to, 59
Guggenheim Foundation, 838
Fund for Promotion of Aeronautics, 642
Guild, Frederic H., 118
Gulick, Luther,

HAEMATOPORPHYRIN, 725
Hay, Robert M., 191
Haiti, 166, 167
Hall, Mordamit, 828
R. Dawson, 400
Ray Cloid, 430
Hamilton, George L., 790
Hampton Roads, Marine Commerce, 243
Hankins, Frank H., 756
Hanum, Halidé Edib, 76, 77
Harbors, 241, 286
Harding, Warren, 90
Hardy, E. R., 362
Harrison Narcotic Drug Act, 111
Hart, Albert Bushnell, 1
James, 15, 26
Hartman, E. A., 730, 731
Harvey, George W., 129
Society, 730
Tercentenary, 731
Haskell, R. J., 387
Havana Conference, 56
Sixth International American Conference at, 58
Spanish War Veterans Conference at, 61
Hawaii, 148-150, 480
Domestic Exports, 150
Education, 149
Immigration, 470
Statistical Classification, 148
Transportation, 149
Vital statistics of, 741
Hawes-Cooper Bill, 492
Hayes, H. K., 715
Will H., 12, 28
Hazard, Daniel L., 663
Healey, Robert E., 12
Health, public, 739-741
Henderson, Charles W., 408
Frances M., 807
Heredity, 706, 707
Laws of, 700
Hertes, Albert, 810
Hesselman engine, 594
Hessian fly, 388
Hetch Hetchy Aqueduct, 246, 606
High Schools, 837
Research in commercial studies of, 847
Highways, Expenditures, 440
Income Sources, 441
and Motor roads, 438-442
Taxation, 208, 209
Hill, Charles E., 162
Historical Society Treatises, 772
History, American, 770-772
Economic, 772
Bibliography of recent works in, 769-772
Far East, 769, 770
Greek, 796, 797
Mediaeval, 769
Modern, 769
of Science Society, 568
Southern, 867
History, Studies in, 769-776
Hobbs' Greenland Station, 672
Hoch-Smith Resolution, 437
Hocking, W. E., 748
Hoetzsch, Otto, 77
Hog Cholera, 386
Home Economics Education, 854
Improvements industry, 315
Homer, 796
Honduras, 50, 51
Lindbergh Flight to, 59
Secretary Kellogg's arbitration proposal to, 62
Treaty with, 323
Hoover, Herbert, 2, 19, 26, 27, 31, 35, 71, 72, 102
On the chemical industry, 690
Good-Will Tour, 56
League of Nations policy, 71, 72
Study of business conditions, 765
Trip to Latin-America, 26, 59
Unemployment policy, 122
Utilities policy, 602, 603
Thomas N., 35
Horn, Robert C., 795
Hosic, James F., 834
House of Representatives, classifications, 90
composition of, 82
Members of, 87, 88, 89
Housing problems, 507-509
Houston, Democratic Convention at, 2, 71
Huebner, S. S., 307, 311, 318
Hughes, Charles E., 17, 28, 55, 58, 59, 68, 74, 165
Latin-American Policy, 58, 59
Hulin, Wilbur S., 751
Hull, Harvey E., 477
Hunter, John, 731
Merlin H., 168, 187, 192
Huntington, E. V., 568
Hurd, Charles D., 680
Hurricanes, 612
Hydraulic machinery, 596, 597
Hydrocarbon gases, interest in, 680
Hydroelectric Plants, 597
Hydrogen-oxygen flame, 678
Hydrographic Office, 212, 214
Hydrography, 657
Hygiene, Mental, 504
Public, 739-741
Social, 501
Hypnotics, 733, 734
Hyslop, J. A., 388

ICELAND, Elections, 517
Idaho, 137
Blue Sky Commission, 339
Bridge engineering, 582
Legislation, 119, 120
Report on coal, 217
Illinois Central Railway, 608
Civil Service, 105
Coal mines, 400, 401
Gasoline tax, 197, 209
Legislation, 121

Illinois mineral examination, 215
Motion pictures, 109
Tax commission, 191, 196, 199
Exemptions, 200
Illumination Congress, International, 641
Electrical, 470, 610, 611
Immigration Act of 1924, 482
Analysis of, 473
Border problems, 475, 478
Chinese, 470, 473, 474
Committee on, 469
European, 473, 475, 476
Filipino, 470
Hawaiian, 470
Japanese, 470
Legislation, 469-476, 477
Mexican, 469, 473
Problems of, 473-476, 477-479
Quota, 469, 472, 477-479
Racial policy of parties, 471
Service, 474, 475, 478
Urbanization, 471
Imperialism, economic, 77
Income tax, 202-205
Of companies, 360, 361
Exemptions, 376, 377
Machinery profits, 645, 646
State, 190
Index, Bradstreet, 309, 310
India, 52, 322
Gold holdings, 349
Prehistoric discoveries, 804
Indiana, art gallery, 808
Coal, 40
Legislation, 120
Indianapolis, Administration, 129, 130
Indians, American, 476, 477, 480
Indices of Trade, 307, 308, 309, 310
Industrial Chemistry, 690
Fatigue research board, 767
Standardization, 637-641
Stock market, 312
Infant mortality rates, 742
Infantile paralysis, 510
Infra-red spectra, 696
Ingalls, W. R., 413
Inheritance tax, 113, 207, 208
Inland Waterways Corporation, 437, 438
Insect control, 719
Pests, 388
Insecticides, 685
Insects, Baker collection, 721
Installment Selling, 314
Institute of Chemistry, Conference of, 683
For Government Research, 132
Of Land and Public Utilities Economics, 199
Of Mining and Metallurgical Engineers, 328
Pacific Relations, 78-80
Politics, 76-78
Institutions, Articulation of, 848
Educational, Pure research in, 865-867
Instruments, geophysical, 650
Insular Affairs, Bureau of, 284
Insurance, 330
Casualty, 365-367
Fire, 362-363
Labor, 524
Legislation, 365
Life, 357-362
Marine, 363-364
Rate problems, 365
Settlements, 360
Underwriting losses, 363
Workmen's, 535-538
Intangibles Tax, 201
Intelligence Tests, 766, 767
Interborough Operations, 235
Rapid Transit Co., 234
Interdenominational Conferences, 540-544
Interior, Department of, Officers of, 95, 96
Internal Commerce, Conditions of, 432
Revenue Bureau, 104
International Association for Dental Research, 738
Astronomical Union, 573
Board of Engineers, 604
Boundary Commission, 212
Cartels, 330
Conference of Social Work, 498
Congress, 751
Abolition of Import and Export Prohibitions, 323
Entomology, 718
Labor and Socialist, 514, 515
Mental Hygiene, 505-507
Education Board, 571
Electrochemical Commission, 641
Illumination Congress, 611, 641
Industrial standardization, 640
Radio Convention, 458
Relations, studies in, 770
Trade control, 331
Internationalist Society of Americanists, 764
Interstate Commerce Commission, 20, 232, 324, 437, 438, 605
Interstate Relations of States, 117
Invertebrate Zoology, 705
Investigations, Congress and legislative, 7
Investment Banker's Association Bill No. 2, 340
Investments, foreign, 320
Iowa, Report on molding sands, 218
Well report, 215
Iraq, 67
Irish Free State, 52
Iron industry, 600
Mergers, 657
Output, 411-413
Price, 412
Use in automobiles, 421
Irrigation, 219
Isaiah, study on Book of, 797
Isostasy, 651
Italian literature, 792
Italy, 52, 64, 67, 322
Archæological work, 806
Stabilization of lire, 355, 357

JADWIN, EDGAR, 286
Jaggar, T. A., 656
Jannings, Emil, 831
Japan, 52, 64, 322
Earthquake engineering, 585
Election of Parliament, 65
Futures markets, 335
Gold holdings, 349
Liquor Convention, 163
Money rates, 357
Relations to China, 76
Religious Conferences, 541
Trade policy of, 335
Japanese Beetle, 389, 719
Immigration, 470
Jardine, W. M., 369, 376, 377
Java, 573
Jay Treaty, 475
Jensen, Jens P., 198, 205
Jeffers, Robinson, 783
Jersey, Transatlantic vessels, 243
Jerusalem, Missionary Conference, 540
Jewish Communal Affairs, 560
Educational Association, New York, 560
Joerg, W. L. G., 669
Johns Hopkins, School of Medicine, 843, 844
Johnson Quota Act, 472, 477, 478
Jones, Ernest, 452
Jones-White Merchant Marine Law, 24, 25, 448, 618, 619, 624
Judaism, 560
Judicial Prosecutions, Federal, 108
State Councils, 124
Judiciary, Personnel of, 106
Jugoslavia, 132, 186, 517
Jurisdiction, Maritime, 162
Justice, Department of, Officers of, 92, 93

KANSAS CITY, Republican Convention at, 2
Gasoline tax, 197
Legislation, 118, 119
Report on oil and gas, 217
Securities legislation, 339, 340
Kanter, J. J., 629
Kasner, Edward, 566
Kavanagh, Marcus, 497
Kellogg, Frank B., 27, 28, 59, 62, 63, 72, 78
Peace Pact, 17, 28, 52-54, 56, 60, 71, 72, 77
Kelly, John B., 557
Kennedy, Emmet, 778
Kent, Fred I., 355
Kentucky, 121
Assessments, 198
Bank tax legislation, 207
Child Welfare Commission, 529
Compulsory School Attendance Law, 512

Kentucky financial taxes, 196
Gasoline tax, 209
Geological Survey, 666
Legislation, 121
Petroleum tax, 199
Railroad assessment, 199
Tax, 190
Administration, 198
Exemption, 200
Legislation, 201
Ketcham Act, 14
Ketchum, Milo Smith, 580
Kettleborough, Charles, 120
Kino, Quinine Monopoly, 329
Kindred, James E., 701
Kirkpatrick, Sidney D., 690
Kish, Early archæological discoveries, 804
Knight, Howard R., 498
Knoxville, 138, 140
Koehne, W., 657
Kofold, Prof., 705
Königsberg, 595
Koussevitzky, Serge, 820
Kramer, Roland L., 319
Ku Klux Klan, 27

LABOR, 309, 310
American Federation of, 521, 523, 525-527, 534
Congress, Pan-American, 525
Department of, Officers of, 94, 95
Employment problems, 529-531
Federations, 526
Financial and Credit Organizations, 525
Insurance, 524
Legislation, 521, 527, 531, 535-538
Mediation, 531-535
Organizations, 521-527
Problems of, 521-527
Relation to capital, 522
to politics, 526-527
Relation of Vocational Education to, 859, 860, 861
Secretary of, 475, 476, 856
Social protective measures, 523, 524, 525
Strikes, 531-535
Woman and child, 528, 529
La Chaise, Gaston, 813
LaFollette Valuation Act, 438
Lame Duck Amendment, 10
Lampson, Sir Miles, 63
Lancha Plana Gravity Dam, 588
Land Office, general, 212, 225
Land Titles and Restrictions, 228
Landes, Bertha Knight, 129
Langdon, Stephen, 804
Langsam, Walter C., 108
Language, English, 785-788
Bibliography of Germanic, 789-790
Germanic, 789-790
Greek, 796
Semitic, 797
Latin America, 18
Exchange rates, 357
Markets of, 322
Latin America, relations, 19, 58
Tariff revisions, 333
Literature, 792-794
Bibliography of, 792-794
Relation to English, 793
Latvia, 50, 516
Laughlin, Harry H., 469
Laurent, Robert, 812
Law schools, 842-843
Laws, Changes in Electoral, 120, 121
Lead, 415, 416
Industries Association, 415
Refining, 415
League, Anti-Saloon, 29
City Charter, 134, 135
Moderation, 29
National Municipal, 144
Nations, 54, 67, 68, 69, 70, 71, 72, 73-76
Committees and Commissions, 75, 76
Covenant, 72, 73
Disarmament Policy, 75
Health Committee of, 740
And Monroe Doctrine, 62, 73
Preparatory Disarmament Commission, 68, 69, 70
Relations with Latin America, 71, 73
Relations to United States, 70-76
Leather Goods Industries, 422
Rise in industry, 466
Lee, Algernon, 514
Legal education, 842-843
Le Gallienne, Eva, 827
Legislation, Agricultural, 375
Book post, 801
Budget, 178-180
California earthquake engineering, 585
Child Labor, 512
For Child Welfare, 510
Citizenship, 479-483
Farm, 390
Federal, 12
Bank tax, 206
Financial and industrial tax, 196, 197
Immigration, 469-476, 477
Insurance, 358, 359, 361
Interlocking directorates, 344
Investigations, 11, 12
Labor, 521, 527-531, 535, 538
Racial integrity, 472
Securities, 338, 339, 340
State, 189, 190
Bank tax, 206, 207
Tax, 196-198
Traffic control, 240
United States Veterans, 271
Utilities, 605
Zoning, 138, 139
Legislature, Philippine, 155
State, 121, 122
Leiden, 573
Leighton, M. M., 214
Leprosy, Philippine Islands, 157
Lewis, John L., 401
Lewisohn, Ludwig, 777
Liability, public, 367
Liberia, 78, 186
Liberty Loans, 182, 183, 184
Libraries, 799-802
Bibliography work of, 800
Collegiate, 841
Conferences concerning, 801, 802
Correspondence school, 800
County, 799
Development of, 802
Miller survey of, 801
Reading research of, 800
School, 800
Ship, 305
Library, Virgin Islands, 160
Gift of John T. Rockefeller, Jr., 76
Schools, 799, 800
License, Foreign Corporation, 197
Tax, 208-210
Lick Observatory, 572, 573, 574, 575, 577
Life Insurance, 357-362
Insurance trusts, 359, 360
Light, physiological effects of, 725
S. F., 705
Lignin, need for chemical research, 684
Sources of, 684
Utilization of waste, 684
Lilley, Ernest R., 403
Limestone, 634
Limitation of Naval Armaments Treaty, 619
Lindbergh, Good Will Flight, 59
Flight to Central America, 167
Virgin Islands, 158
Good Will Tour, 17
Lindgren, Waldemar, 657
Linseed oil, production of, 427
Liquor Convention with Japan, 163
Law Violations, 490
Literature, bibliography of English, 785-788
Germanic, 789-790
English, 785-788
French, 790-791
Germanic, 789-790
Greek, 795-797
Italian, 792
Latin, 792-794
Semitic, 797
Spanish, 791-792
Zoning, 139
Literary Digest, Election poll, 765
Litvinoff, 69
Livestock, 371, 372, 382, 392
Llewellyn, Karl N., 497
Loans, Brokers', 348
Lobbying, problem of, 121
Locke, Charles E., 397
Locomotives, 601, 602
Locust, Seventeen-year-old, 722
Loeb Classical Library, 795
Logic, 749
London, futures markets, 335
Insurance market, 364
Money rates, 356
Loomis, A. M., 386
Frederic B., 908

Lord, General, 174, 181, 182
Los Angeles, 136
Flight, 303
Lighting system, 611
Metropolitan Water District, 236
Opera, 817
Orchestra, 819
World Sunday School Convention, 543
Louisiana, legislation, 119, 120, 537
Taxes, 199, 202
Love, Robert A., 314
Lowden, Frank, 2, 496
Lowell, President, 844
Lowy, Alexander, 689
Luce, Robert, 180
Lutheran United Church, 552
Convention, 551, 552
Lutheranism in Soviet Russia, 552

MacCORMICK, AUSTIN H., 491
MacDonald, A. F., 117
Thomas H., 438
Machado, President, 62, 329
Machinery industry, American, 644-648
Use of, 315, 419
MacKenzie, Roderick D., 809
MacLeish, Archibald, 783
Macmahon, Arthur W., 7, 12
MacMurray, 57
Magnesium, Production of, 687
Magnet observatories, 664
Magnetic methods, 664
Surveys, 663
Magnetism, Terrestrial, 663
Magoffin, Ralph Van Deman, 804
Maine, Earthquakes in, 652
Utilities policy, 604
Maizewood, utilization of, 692
Malaria, Philippine Islands, 157
Malaya, 78, 331
Malcom, Roy, 164
Manganese, 398
Manhattan housing projects, 509
Transatlantic vessels, 243
Mann, Lawrence B., 418
Manufactures, Exports of, 423
Statistics of, 464
Manufacturers, National Association of, 308
Manufacturing Concerns, Failures, 423
General conditions, 418
Output in 1928, 419
Map, International, of the World, 669
Latin America, 669
Publications, miscellaneous, 670
Maps, Meteorological, 670
States, 669
Marine Corps, 295
Engineering, 618-623
Insurance, 363, 364
Maritime Jurisdiction, 162
Marketing, 376, 389-392
Cooperative, 112, 390, 391
Scientific, 433
Markets, foreign, 322
Security and money, 311-314
Marriage, data on, 485
Marsh, Arthur Richmond, 335
Fred Dana, 810
Marshall, John, 804
Marshal's Office, United States, 107
Martin Act, 338
Everett Dean, 861
Marvin, Thomas O., 425
Maryland, National Park and Planning Commission, 137
Taxes, 190
Massachusetts, 122, 209
Compulsory Automobile Insurance, 365, 366
Corporation tax, 205, 206
Education for penal officials, 495
Gasoline tax, 197, 209
Income tax, 203, 204
Industrial exemptions, 200
Judiciary, 124
Labor mediation, 532, 533
Motor vehicles tax, 201
Supreme Court, 205
Taxes, 190, 191
Utilities Bill, 605, 606
Massena, Ritual Murder Incident, 562
Master Printers Building, 584
Mathematical Association of America, 570
Societies, meetings of, 570
Mathematics, 566-571
Expansion problems, 568
History of, 568, 569
Infinite series, 567
Linear difference equations, 568
Logical principles, 568
Prizes, 570
Publications on, 569
Statistics, 568
Theory of Groups, 568
Theory of Numbers, 568
Mather, Kirtley F., 650, 652
Mathews, John M., 52, 117, 121-123
Maurer, James H., 514
McAdam, D. J., Jr., 628
McAdoo, William G., 30
McBain, Howard Lee, 111
McBride, F. Scott, 29
McCormick, J. F., 748
McCoy, Frank R., 57, 60, 165
McIntyre, Frank, 146, 150, 154
McKay, A. W., 389
McLaren, Walter Wallace, 76
McNary-Haugen Bill, 2, 9, 15, 377, 390
McNary-McSweeney Act, 376
Mead, Bennet, 488
Meat Products, 382, 383
Meat, standardization of, 639
Mechanical Engineering, 591-602
Medical Department, Army, 283
Education, 843, 844
Medicine, 728-729
Anniversaries of progress in, 731, 732
Medicine, relation to chemistry, 733
Melchett, Lord (Sir Alfred Mond), 331
Mellon, Andrew, 12, 28, 180, 207
Memoirs, bibliography of, 774, 775
Memphis, National Conference of Social Work, 500
Mencken, H. L., 59
Mendel, Gregor, 700
Mendelian law, 700
Mengleberg, Willem, 818
Mental Hygiene, 504, 838, 839
Tests, Bibliography, 768
Measurements, 764-768
Merchant Marine, 12, 447-451
Act, 24, 25, 618, 619, 624
Government ownership, 447
Maintenance figures, 447
Private ownership, 448
Merchandise, exports and imports, 320, 321
Mart, 584
Merger movement, 329-330
Utilities companies, 607
Merit System, 101, 102
Mesopotamia, Expedition of Field Museum of Chicago and Oxford University, 804
Metallic minerals, 657
Metals, corrosion of, 627, 628
Fatigue of, 628
Joint Research Committee, 629
Transportation, 600, 601
Testing of, 635, 636
Metaphysics, 748
Metazoa, Cytology, 707
Morphology, 706
Physiology, 707
Regeneration, 707
Meteor Society, 576
Meteorological Explorations, 662
Meteorology, 660
Forest, 663
Guggenheim Aid, 660
Methodism, Conferences, 553
Methodists, Negro, 555
Protestant Church, 555
Metropolitan Planning, 135-137, 139-141
Mexican Bean Beetle, 389, 720
Fruit Worm, 719
International Boundary Commission, 60
Oil Settlement, 60
Mexico, 27, 28
Archæological discoveries, 763, 764
Boundary Settlement, 60
City, Lindbergh Flight to, 59
Conflict with Roman Catholic Church, 543
Earthquakes, 655
Immigration to U. S., 469, 473
Librarian Congress in, 801, 802
Ministry of Education, 801-802
Oil controversy, 18

Mexico, Output of gold and silver, 410
Persecution in, 558
Miami Copper Co., 379
Michigan, Fiscal reform, 126
Glacial and hard rock survey, 215
Law, 101
Legislation, 119
Survey of resources, 666
Military Education, 259
Problems of United States, 255
Militia Bureau, 283
Milk, public health researches in, 740
Millay, Edna St. Vincent, 782, 783
Miller, A. J., 727
D. G., 633
Survey, 801
W. B., 628
Mills, Chester P., 28, 34
Millspaugh, Arthur C., 166
Milton, John, 788
Milwaukee, 133, 134, 136
Mineral Exploration, 225
Fertilizers, 658
Industry, 328, 397, 522
Leasing Act. 227
Mineralogy, Progress, 658
Minerals, Increase in output, 432
Metallic, 657
New, discoveries, 659
Non-metallic, 658
Mining, 397
Taxes, 202
Ministry, Education for, 844, 845
Minneapolis, 136
Opera, 817
Orchestra, 819
Minnesota, Administration, 123
Reorganization Act of, 123
Civil Service, 105
Missionary Conference, Congo, Africa, 540
In Jerusalem, 540
Mississippi Flood Control, 255, 288
Inheritance tax, 207, 208
Labor legislation, 537
Motor registration tax, 209, 210
River bridge, 582
Commission, 212, 213
System, 241
Tax exemptions, 190, 200
Taxes, 191
Valley, Archæological Survey, 763
Missouri, Insurance Rates, 113
Mitten Settlement, 522
Mixed Claims Commission, 364
Mobile, waterfront freight handling, 244
Moderation League, 29
Moffett, W. A., 301
Mohler, John R., 386
Mokelumne System, 247
Moncada, José, 57, 164
Monchow, Helen C., 228
Money market, 314, 320, 346
Mongolia, Collecting in, 709
Monroe Doctrine, 56, 62, 73
Relation to Kellogg Pact, 53
Paul, 284
Montana, bank tax legislation, 207
Montevideo, 58, 68
Moore, John Bassett, 28, 55, 71, 74
Most-Favored-Nation Trade Policy, 332
Morgan, Herbert E., 106
Morgenthau, Henry, 30
Morphine, 733
Morphology, 711
Morrow, Dwight W., 18, 28, 58
Mortgage Recording Tax, 114
Mosher, William E., 132
Moths, Howard Lee Clark Collection, 712
Motion Pictures, 330, 829
British, 831
Relation of education to, 868
Speech and sound, 828
Motor bus, Intercity, 443
Service, 442-444
Urban, 443
Registration Tax, 209
Mount Wilson Observatory, 571, 572, 573, 574, 578
Movietone, 828
Mueller, Herman, 516
Municipal Activities, 234
Administration of property tax, 195
Administration Report, 144
Budget, 130
Corruption, 131
Electrical Systems, 234
Expenditures, 192-196
Funds, administration of, 195, 196
Home Rule, 133, 134
Indebtedness, 195
Institutes, 144
League, 144
Lighting, 611
Ownership, 233
Projects, 247
Property revenue, 194
Prosperity, 130
Public service revenue, 194
Radio Stations, 144
Reorganization, 131
Revenues, 194
Tax levies, 194
Taxation, study of, 100
Muscle Shoals, 10, 15, 251
Bill, 605
Music, 774, 815
Festivals, 821-823
Musical productions, 827
Mycology, 713

NANKING, 57
Incident, 63
National Academy of Design, 808
Academies, Exhibits in, 811
Advisory Committee for Aeronautics, 455, 596
Aid System, 859, 860
Association of Elementary School Principals, 836
National Association of Finance Companies, 316, 317
Association of Manufacturers, 308
Association of Secondary School Principals, 839
Banks, development of, 341, 342, 343, 344
Board of Dental Examiners, 737
Board of Fire Underwriters, 142
Catholic Welfare Conference, 559
City Bank, 308, 309
Commercial Teachers' Association, 846, 847
Conference of Commissioners on Uniform State Laws, 340
For Social Work, 500
On Education, 869
Convention, Democratic, 1928, 2
Republican, 2
Platforms, 2
Council of Teachers of Mathematics, 570
Crime Commission, Recommendations of, 495
Report of, 496
Condition, 491
Debt, 182, 183
Directory of Commodities Specifications, 640, 641
Education Association, 751, 800, 839, 868
Federation of Iron and Steel Manufacturers, 596
Guard, 257
Industrial Conference Board, 191, 637
Relations of States, 117
Research Council, 751
Safety Conference, 240
Tax Association, 191
Vocational Education Act, 851, 853-855, 857, 859, 861
Naval Academy, United States, 304
Aeronautics, 301
Architecture, 618-623
Construction and Equipment, 298-301
Cruiser Bill, 618, 619
Education, 304
Fuel, 622, 623
Officers, post-graduate course, 660
Oil Leases, 11
Policy, 17
War College, 305
Navy, Department of, Officers of, 95
Functions of, 296-298
Open-door Policy, 296
Organization of, 292
Neanderthal Man, 762
Nebraska, Civil Service, 105
Needham, Dr., 705
Negro, Cultural Achievements, 758
Fiction Study of, 778

Negro Methodists, 555
Migration of, 470
Population of, 470
Urbanization of, 471
Nemea, Discovery of, 805
Nerves, respiration of, 726
Sensory, 723
Nervous System, 702
Netherlands, 50
East Indies, 328, 329
Gold holdings, 349
Money rates, 356
West Indies, 322
Nevada, Production of Gold, 410
Property tax, 198
Newcomer, Mabel, 202, 207
New England, Fishing vessels, 393
Guinea, Explorations to, 675
Hampshire, gasoline tax, 197
Income tax, 204
Taxes, 191
Jersey, Civil Service, 105
Educational requirements, 512
Fiscal reform, 126
Labor legislation, 138, 528, 536, 537, 538
Property tax, 198
Regional planning, 126
Tax Administration, 198
Collection, 201
Commission, 196
Exemptions, 190
Sale Act, 196
Traveling Mental Hygiene Clinic Service, 506
Mexico, Culture of cliff dwellers, 763
Geological Map, 215, 216
Legislation, 119, 120, 199
Oil Deposits, 218
Orleans, Trade with Buenos Aires, 244
Newtonian Mechanics, 568, 569
New York, Administration, 123
Aqueduct Contract, 246
Bank taxation, 206
Barge Canal, 241
Bureau of Municipal Research, 125
Central Building, 814
Railroad, 608
New York City, 130-132, 135, 136, 141
Banks, 348
Check transactions, 318, 319
Fare Case, 234
Futures markets, 335
Insurance, 367
Junior Vocational Schools, 837, 838
Urban transportation, 608
Committee on Retrenchment and taxation, 198
Compulsory School attendance, 513
Corporation tax, 197, 206
Department of Labor, 309
Earthquakes in, 652
Edison Company, 611
Educational progress in, 834
New York City, Financial taxes, 196
Governor's Term, 123
Hospital—Cornell Medical College Association, 844
Housing of colored population, 508
Housing Law, 508, 509
Income tax, 197, 204
Increase in transit fare, 441
Industrial Survey Commission, 529
Inheritance tax, 208
Labor legislation, 528, 536, 537, 538
Mediation, 532, 533
Legislation, 121, 139, 140
Meeting of Anglo Catholics, 546
Metropolitan Opera, 816
Money rates, 356
Motion Pictures, 109
Power and Light Corporation, 611
Prison Association, 495
Property taxes, 198
Public Library, 800
Queens Sewer Scandal, 128, 129
Regional planning, 126
Securities legislation, 338
Special Franchise Tax, 199
Stock Exchange, 307, 311, 312, 313, 318
Taxes, 190, 191, 196, 201
University, Sociological research, 866
Utilities policy of, 604
Westchester County, 124-126
Workmen's Compensation, 366
New Zealand, 52, 851
Nicaragua, 18, 57, 58, 164, 180
American Policy, 58, 59, 60, 61, 62
Election Results of, 60, 61, 165
Secretary Kellogg's Position, 164
Niagara Falls, 612
Planning Board, 136
Nickel, 330
Alloys, 631
Nitrate industry, 329
Nitrogen, atmospheric, 689-690
Production in United States, 692
Nobile Expedition, 671
Noble, G. Kingsley, 699
Noguchi, Hideyo, 728, 732, 739
Non-Metallic Minerals, 658
Non-metals, developments in, 632
Norris Resolution, 251
North America, Interest in prehistoric archæology, 763
Markets of, 322
North Carolina legislation, 119
Taxes, 190
North Dakota, administration, 123
Assessments, 198
North Dakota, Legislation, 120
Tax Commission, 190
Northwest Fire School, 142
Norton, John W., 810
Norway, Labor Party, 517
Notz, William F., 328
Novel, historical, 779
Developments in, 776-780
Detective and mystery, 780
Nursing, Education in, 741
Nutrition, dental researches on, 738
Nystrom, Ames B., 384

OAKLAND, Cal., Importance as port, 245
Oats, 380
Observatories, Dudley, 576
Flower, 572
Harvard College, 572, 578
Lick, 572-575, 577
Mt. Wilson, 571-574, 578
South Africa, 572
Sproul, 574
Occupational Tests, 766
Ochs, Adolph S., v
O'Connor, Johnson, 764
Odum, Howard, 778
Officers Training Corps, 305
Ohio, Analysis of coal, 217
County Government, 126
Legislation, 122
Oil, in Arkansas, 216
Burners, 316
Industry, 328
Lease Cases, 110
Settlement with Mexico, 60
Oklahoma, assessments, 198
Motion Pictures, 109
Oil industry, 328
Production of oil, 404
Road building materials, 218
Studies of Stratigraphy, 216
Water Resources, 219
Old Age Pensions, 521, 522, 523, 528, 537, 538
Olivier, C. P., 572
Olmstead Case, 110
Olmsted, H. M., 233
Olson, Albert, 809
Olynthus, Discovery of, 805
O'Neill, Eugene, 823
Onions, Cost Records, 427
Open-door Policy of Navy, 296
Hearth Furnace, 600
Opera, 815
American, 816
Chicago, 817
Philadelphia, 817
Opium Committee, 76
Orchestra, Chicago, 818
New York Philharmonic, 817, 818
Ordinance, Model, 143
Bureau, Armament of Aircraft, 457
Schools, 264
Ore deposits, 656
In Arizona, 217
In New Mexico, 218
In Virginia, 218
Dressing, 397, 398, 399
Oregon, income tax, 203
Securities legislation, 340
Tax remission, 200

Organic Chemistry, 680
Organized Reserves, 257
Orient, research literature on, 798, 799
Oriental Exchange Rates, 357
Fruit moth, 389
And Near Eastern Relations of the U. S., 63
Owyhee Gravity Dam, 588

PACIFIC Coast, earthquakes, 653, 654
Hawaiian-Great Lakes Route, 241
Problems of, 78-80
Protection of Lalient, 162
Relations, Institute of, 78-80
Painting, 807-810
Mural, 809, 810
Palæography, 794
Paleontology, publications on, 710
Vertebrate, 708-710
Palestine, 66
Archæological findings, 804, 805
Panama, 62
Canal, 285
Zone, earthquakes, 655
Lindbergh flight to, 59
Rejects treaty with U. S., 166
Pan-American Arbitration Conference, 19, 68, 73, 74
Child Welfare Congress, 510
Conference, Sixth, 16
Labor Congress, 525
Sixth Conference, 67
Standardization Conference, 639
Union, 19, 67, 68
Union, 56
Paper, made from cornstalks, 691
Paraguay, 68, 71
Dispute with Bolivia, 19, 59
Parallelism, theory of, 848, 849
Parasitology, papers on, 708
Paris, International Conference of Social Work, 498
Library School, 800
Parker Bill, 738, 741
Parking problem, 238, 239
Parkhurst, Helen, 834
Parks, Governor, 146
Parliament, attitude to Anglican Church, 543
Parrish, Anne, 777
Part-time schools, 851, 852
Patent Office, æronautic, 456
Patents, influence on machinery industry, 646, 647
Pathology, 727, 728
Bibliography of, 728
Peach boxes, 389
Peanuts, production of, 427
Peking, 63
Penal conditions, 491
Pennsylvania, committee on penal affairs, 495
Geological survey, 216
Pennsylvania, Legislation, 120, 121
New Museum, 807
Production of oil, 404
Railroad, 607, 608
Regional planning, 126
Supreme Court, 521
Pensacola, terminal equipment, 244
Pensions Bureau, 268
Military and Naval, 267
Old Age, 521-523, 528, 537, 538
Per Cent Clubs, 173, 181, 182
Persia, 67
Tariff autonomy of, 334
Treaty with, 323
Personnel Classification Board, 173, 174
Division, Civilian, 285
Of Judiciary, 106
Peru, 68
Chile controversy, 27, 62
Hoover trip to, 59
Pests of animals, 386
Insect, 388
Peterkin, Julia, 778
Petrography, 658
Petroleum, 330, 398, 403-405, 622, 623
Anti-knock value, 680
Exports, 321
Fuel oil, 403
Law of 1925, 60
Production, 420, 658
Products of, 634, 635
Taxes, 199
Pharmacology, 733-735
Philadelphia, 128, 136, 141, 142
Fuel oil testing plant, 623
Maritime trade, 243
Opera, 816, 817
Orchestra, 820
Police investigation in, 128
Rapid transit, 446
Philippine Islands, 154-157, 322
Business flourishes in, 284
Citizenship problems, 480
Education, 156
Immigration, 470
Labor legislation, 527
Marriage Law, 512
Islands and Opium Committee of League of Nations, 76
Organic Act, 112
Trade, 156
Philosophy, 746
History of, 747
Publications, 746, 747, 749
Of the State, 749
Photochemistry, 679
Physics, 694
Mathematical, 569
Theoretical, 697, 698
Physiology, 723-726, 754
Plant, 712
Pictures, motion, 828
Pierard, Louis, 77
Pilsudski, 516
Pi Mu Epsilon, 570
Pituitary Gland Extracts, 729, 730
Pittman Act, 227
Pittsburgh Service, 242
Planning, Metropolitan and Regional, 135, 136, 137
Plant diseases, 387, 388, 716
Physiology, effect of X-rays, 712
Quarantine, 719
Plate glass, output, 426
Plato, 747
Platoon Plan, 835
Platt Amendment, 61
Plumbing, 315
Plymouth Rock, Protestant pilgrimage, 550
Pocket Veto, 10
Poetry, American, 781-784
Bibliography of American, 781-784
Commercial success of, 781-782
English, 787-788
Magazines of, 781
Prize awards in, 782
Poincaré, Raymond, 355, 356
Poisseuille, Jean L-M., 731, 732
Poland, 52
Victory of Socialists, 516
Police Investigations, 128
Poliomyelitis, 739, 740
Polish flight, 672
Politics, City, 128
Institute of, 76-78
Labor in, 526-527
Polygenic, Functions of, 566
Pond, G. K., 165
Ponsot, M., 66
Population, classifications of, 484, 485
Growth of, 483
Negro, 470
Relation to immigration, 476
Statistics, 483
White immigrant, 470
Port of New York Authority, 289
Porter Bill, 494
Portland, Maine, Canadian grain outlet, 242
Cement, manufacture of, 466
Porto Rico, 78, 150-152, 612
Education, 151
Floating debt, 285
Labor legislation, 528, 535, 536, 538
Public Works, 151
Sugar crop, 150
Trade, 150
Ports, Commerce of, 289
Portugal, 64
Postal Rates, 14
Post Office Department, offices of, 93
Potato, Record production, 371
Potatoes, Cost record, 427
Poultry industry, 372, 384
Power utilities, 603
Pragmatism, 750
Prague, 640
Pratt, George K., 504
Preferential Tariff Movement, 333
Presbyterian Church, 555
Assembly in Atlanta, 556
President, relation to Federal education, 856

Presidential campaign, attacks on Catholic Church, 558
Expenditures of, 4
Socialist party, 514
Election, 1, 29-32, 35, 71, 126
Prevention work in delinquency, 495
Pribilof Islands, 147
Prison Labor, 491
Prisons, Education in, 493
Medical Service, 493
State, 491
Private Banks, 354
Production, control of, 328
Relation to employment, 530
Progressive Education Association, 836
Prohibition, 3, 27, 29-35, 110, 117
Appointments, 105, 106
Bureau of, 97, 98
Effect on Crime, 32-34
Effect on Health and Morality, 33, 34
Padlocking, 115
Seizures, 114
Property, State Tax, 189
Taxes, 198
Tax, municipal administration of, 195
Protestant Denominational Activities, 544
Episcopal Convention, 544, 545
Theological Seminaries, 844
Protozoa, life cycle, 706
Metabolism, 706
Psychiatric Association, Recommendations of, 496
Service, 496
Psychological Advance, 764
Index, 751
Tests, Conclusions, 767
Psychology, 751
Animal, 755
Behavioristic, 752
Educational, 755, 756
Emotion in, 754
Imagery, 754
Memory, 754
Publications, 751, 752, 753
Sensory, Experiments in, 753
Psychopathology, Papers on, 754, 755, 756
Psychophysics, Studies in, 753
Pt. Barrow, Radio Station, 661
Public Health, 739-741
Council, Sanitary Code, 245
Lands, 225
Service Commissions, 230-233
Law, 234
Training, 132
Publishing, changing conditions of, 781
Purnell Act, 376

QUARTERMASTER Schools, 264
Queens Sewer Scandal, 128, 129
Quinine, 329
Quota Act, Johnson, 472, 477, 478
Quota Immigration, 472, 477-479
Mexican, 469

RABBINICAL Education, 845
Race conditions in United States, 469-472
Radburn, model town, 508
Radcliffe, Lewis, 392
Radio, 13, 110, 330, 458, 607
Act, 23, 460
Aeronautic, 463
American Samoa, 162
Beacons, 454
Broadcasting allocation, 460
Litigation, 24
Manufacture, 459
Marine, 463
Market, 315
Merger with Great Britain, 462
Municipal, 144
Progress in broadcasting, 458
Relation to physiology, 723
Station at Pt. Barrow, 661
Transmission, 665
Use of in presidential campaign, 3, 461
Railroad assessment, 199
Consolidation, 20
Engineering, 601, 602
Labor Act, 531-532
Mediation Boards, 531, 532, 533
Stock market, 312
Wage Dispute, 532
Railroads, 434-438
Capital expenditures of, 327
Employees, 435
Equipment of, 324
Expenses, 436
Finances, 435
Mileage of, 324
Operating revenues of, 324
Revenues, 436
Traffic of, 323-327
Railway electrification, 253, 607, 608
Railways, Articles on, 668
Electric, future, 447
Urban and interurban, 444
Raman, Importance of discovery, 679
Raskob, John J., 2, 27, 29
Rastall, W. H., 644
Rate fixing, 230
Rawson-MacMillan Expedition, 672
Rayon, Domestic output, 692
Production of, 467, 693
Reading, Administration, 130
Railroad, 608
Socialist Government, 130
Reclamation, 219
Recreation Association of America, 512
Reformed Dutch Church, 556
Refrigeration, 599-600
Regional Planning, 126, 135, 137
Regular Army, functions of, 257
Reid, A. Duncan, 365
Reiner, Fritz, 818
Relations, Church and Government, 543
Of States, National and Inter-state, 117
Religion, 748
Collegiate aspect of, 841
Remus Case, 495
Representatives, Congressional Affiliations, 85
Ages of, 83
Educational Standards, 84
Election of, 36-44
Public services of, 85
War service of, 84
Reproductive System, 702, 704, 705
Research, faculty of, 841
Pure, 865-867
References on, 867
Reserve Bank Credit, 346
Respiration, Cutaneous, 725-726
Nerve, 726
Retirement Law, 98
Revenue Act, 104, 111, 175, 176, 202, 207, 360
Bureau, Status of Employees, 105
Federal income tax, 202, 203
State income tax, 204
Reynolds, Socialist-Labor, 35
Rhenium, Value of, 676
Rheumatic Fever, 727
Rhode Island, bridge engineering, 581, 582
Child Labor, 513
Legislation, 118, 119, 121, 528, 529, 537
Securities, 340
Tax exemptions, 200
Rice, Calvin W., 591
Richards, Bernard G., 560
Roads, appropriation for, 14
Roback, A. A., 746
Robinson, G. Canby, 844
Joseph T., 2
Rochester, 131
Meeting, Federal Council of Churches, 542
Orchestra, 820
Rockefeller Institute, 844
John D., Jr., 76
Rodgers, William L., 292, 296
Roger Bill, 45
Roland Marcel, Pierre, 802
Rolfe, John C., 792
Roman Catholic Church, 557
Conflict in Mexico, 543
Religion, literature on, 793, 794
Writers, literature on, 793
Romance Languages, 790-792
Literature, 790-792
Bibliography of, 790-792
Rome, Excavations in, 806
Roosevelt, Franklin D., 28, 123
Root Arbitration Conventions, 51
Elihu, 71, 74
Rowden, Dorothy, 799
Rowe, L. S., 58
Rowland, Theory of, 574
Royce, Josiah, 750
Rubber, electrodeposition, 688
Industry, 328
Rumania, Elections in, 517
Rural Government, 124-126
Russell, Bertrand, 746
Sage Foundation, 740

Russell, William Fletcher, 869
Russia, 55, 186, 328
  Relations with League, 69, 70
  Relations with Persia, 67
  Religion in, 544
Rye, 381

SACCO-VANZETTI, Case of, 122
Sampson, Governor, 121
Sale, Government Lines, 25
Salt Creek, Oil Lease Cases, 110
Salvation Army, 556
San Francisco, 140
  Municipal ownership, 235
  Orchestra, 819
  San Matteo Survey, 125, 126
  Trade leadership, 245
  Utilities problems, 606
  Water System, 236
San Salvador, 67
  Lindbergh Flight to, 59
Sand, René, 498
Sanders, Everett, 90
Sandino, General, 57
Sandistas, Surrender of, 61
Santa Rosa Elephants, Discovery of, 709
Santiago, 572, 577
Sargent, John G., 377
Satin moth, 720
Savannah, water-borne commerce, 244
Savings Banks, 350
Scandinavian currency, 356
Schenectady, 131, 132
Schiller, F. C. S., 751
Schlapp, Max G., 497
Scholer, C. H., 633
School, Commuters, 862
  Evening, 862
  Grammar, 862
  Policies, 765, 766
  Savings banking, 352, 353
  System, cooperation with business, 766
Schopenhauer, 747
Schubert Centenary, 815, 816
Schuman, Frederick L., 49
Schuyler, William M., 90, 106
Scotch marine boilers, 626
Scotland, Church unions, 548
Scott, James Brown, 58
  Winfield, 267, 268
Sculpture, 811-814
Seattle, Administration, 129
  City Politics, 129
  Fishing Vessels, 393
  Municipal Street Railway, 236
Secondary Education, 837-839
Securities, Protection of, 338
Security Market, 311-314
Seed Council of North America, 715
Seismograph Stations, 655
Semitic languages, 797
  Literature, 797
    Bibliography of, 797
Senate, Classification, 90
  Composition of, 82
  Members of, 86
Senatorial Elections, 35, 36, 37, 38, 39, 40, 41, 42, 43 44
Senators, Affiliations of, 85
  Ages and experience of, 83
  Educational Standard, 84
  Public Services of, 85
  War Service of, 84
Sensation nerves, bases of, 723
Separatist Movement, 523
Service Schools, 260
  Infantry, 260
Sevensma, Tietse Pieter, 802
Seventieth Congress, Personnel Analysis of, 82
Severance taxes, 201
Sewage, scientific disposal of, 740
Sforza, Carlo, 77
Shands, William R., 338
Shapley, L. S., 160
Shear, T. Leslie, 805
Sheets, E. W., 382
Sheldon, P. K., 241
Sheppard - Towner Maternity Act, 528, 538
Shifted rays, corpuscular theory, 695
Shipbuilding, Atlantic Liners, 624
  Auxiliary electrical equipment in, 627
  Great Lakes, 624
  Motor, 595
  Pacific Liners, 624, 625
Shipping Board, 24, 25, 364, 592, 623, 627
  Service, coastal and intercoastal, 449
Ships, construction and design of, 619
  New developments in building, 619-626
Shipstead, Senator, 521, 526, 530
Short, Lloyd M., 20
  Story, the, 780
Sibert, W. G., 250
Signal Corps, 278, 279
  School, 262
Signatories, Kellogg Pact, 52
Silver, 320, 408-411
  Monetary value in United States, 408
Sinclair, Harry, 28
Singer, Jr., William H., 809
Sioux City, Bureau of Municipal Research, 132
Sisson, Francis H., 182
Sitterly, Bancroft Walker, 571
Slack, L. Ert, 129, 130
Slechter, S. H., 530
Slemp, C. Bascom, 90
Smith, Alfred E., 2, 26-31, 35, 102, 103, 117, 558
  Legislative Proposals of, 121, 122
  Message to N. Y. Legislature, 124
  Plan for Gubernatorial Election, 122
  Queens Sewer Scandal, 129
  Utilities policy of, 603, 604
Smith, College, Opera, 817
  Edward H., 497
  George Otis, 328
Smither, H. C., 173
Smithsonian Institution, 96
  Aeronautic activity, 457
Snake River Canyon bridge, 582
Social Education, 501-504
  Hygiene, 501
  Science Research Council, 759, 760
    Encyclopedia of, 760, 761
  Work organized, 498
Socialism, 514-517
Socialist Government in Reading, 129
  Party, 514
  Labor, 514
Society of Naval Architects and Engineers, 626
Sociology, 756-761
  Family disorganization, 757,
  Familiy disorganization, 757, 758
  Publications on, 757, 758, 759, 761
  Research in, 757
Soil Study, 667
South, fiction study of, 779
  Africa, 52, 572, 851
  America, industrial standardization of, 639
  Carolina, county government, 125
    Legislation, 120, 121
    School attendance, 513
    Taxes, 190
  Dakota, Gold and Silver Output, 410
  India, Church Unions, 547
Soviet Russia, Lutheranism in, 552
  Recognition of, 18
Spain, 64, 322
  Money rates, 357
  Trade policy of, 332
Spanish Literature, 790-791
  War Veterans' Conference at Havana, 61
Speller, F. N., 628
Sperry Rail Tester, 636
Spheres of American Influence, 164
Spleen, 726
Spring, L. W., 629
Sproul Observatory, 574
Spry, William, 225
St. Francis Dam, 587, 588, 612
St. Louis, 140, 147
  And O'Fallon Case, 232
  Orchestra, 819
St. Paul, 136
Stall - McCracken Expedition, 674
Standardization, Agricultural, 639
  Industrial, 637-641
  International, 640
  Pan-American Conference of, 639
Standards, Types of Industrial, 638
State banks, 341-344
  Developments of, 343, 344
  Relation to Federal Reserve System, 345
  Tax legislation, 206, 207
Budgets, 187, 191, 192
Constitutional changes, 190

State Corporation Commission, 328
Department of Education, 843, 844
Officers, 90, 91
Education, 188
Expenditures, 187, 188, 189
Geological Surveys, 214
Highways, 188
Legislation, 189, 190
Municipal League, 145
Public Institutions of, 188
Railroad Commission, 328
Relations with Federal Courts, 606
Revenues, 187, 189
Subventions and Grants, 189
Supervisors of Commercial Education, 847
Tax Commission, 191
Exemptions, 190
Income, 190, 197
Inheritance, 191, 197
Legislation, 196-198
Motor, 190
Property, 189
Taxation license, 190
Taxes, 189-192
Utilities Commissions, 602, 603
Vocational education, relation to Federal, 859
States, administration of, 123
Conservation of resources, 120
Constitutional Amendments of, 36
Developments of, 118-120
Court Reorganization of, 119, 120
Executives and Departments, 122
Federal Aid to, 173, 188
Financial Problems of, 119
Fiscal Reform in, 126
Judicial Councils of, 124
Judiciary of, 123
Labor Mediation Boards, 532, 533
Legislatures and legislations, 121, 122
Municipal and Local Amendments of, 120
Relation of government to industry, 123
Statistics of birth and death registration, 742
Tax Provisions of, 118, 119
Statistics, Air Mail, 642
American machinery industry, 645
Of Automobile Registration, 237
Brokerage loans, 348
Casualty insurance, 367
Causes of death, 744
Central Gold Holdings, 349
Check transactions, 319
Classification of Public Debt, 184
Of War Debts, 187
Of Coastwise Commerce, 29
Comparative Expenditures of States, 1915-1926, 187
Composite bank data, 355
Construction, 222
Corporation income tax, 204
Statistics, Crop Acreage, 223
Customs Transactions, 425
Death rate from motor accidents, 238
Diplomatic personnel, 48
Disability and accidental death benefits, 359
Elections of 1928, 6
Electoral and Popular Votes for President, 35
Electric Lighting, 248
Railway industry, 445
Electrical goods orders, 603
Federal Expenditure, 179
And Revenues, 168, 169, 170, 171, 172, 179
Income tax, 203
Reserve Banks, 347
Fisheries, 394
Foreign Service Reclassification, 47
Trade, 320, 321
Freight Traffic, 290
Gasoline Tax Rates, 191
Grain and Cotton Crops, 378
Hawaiian Classification, 148
Exports, 150
Indices of Trade, 310, 311
Insurance increase and rates, 358
Life and industrial, 361, 362
International Conferences, 70
Manufactures, 419, 464
Marriage and divorce data, 485
Mexican birth rate in United States, 469
Immigration, 469
Money Market, 314
Municipal debts, 195
Expenditures, 192, 193, 194
Revenues, 194
Mutual savings banks, 351
National banks, resources, 341
Naturalization, 481
New York Stock Exchange, 313
Percentage of State Receipts, 189
Population, 483
Registration, 484
Public Lands, 228
Radio manufacture, 459
Radio sales, 460
Railroad mileage, 324
Operating averages, 326
Traffic, 327
Rates of duty, 428, 429
Reclamation fund, 221
Registration, births and deaths, 743
Revenue Receipts of States, 189
State Income Tax, 205
Sales and Leases, Indian Lands, 226
Savings deposits in banks, 352
Security market, 313
State banks' resources and liabilities, 343
Birth registration, 742
Statistics, Death registration, 742
Income tax, 203
Stock savings banks, 350
Strength of Regular Army, 274-276
Types of highways, 440
Trust companies, 353
Vital, 742-744
Volcanic disasters, 652
World air transport, 643
Steam plants, 611
Turbine, 592
Steamships, turbine developments in, 624, 625
Steel, 668
Advance in price, 412
Carbon, 583
Chrome, 583
High strength, 583
Industry, 600
Mergers, 657
Metallurgy of, 630
Nickel, 583
Period of depression, 667
Prevention of corrosion, 689
Production, 411-413
Silicon, 583
Structural, 629, 630
Use in automobiles, 421
Steele, Theodore C., 808
Wilbur Daniel, 777
Stevenson Creek Dam, 636, 637
Restriction Plan, 328
Stewart, Ethelbert, 521, 530
R. W., 12
Stiles, Percy G., 723
Stimson, Governor General, 154
Stock market speculation, 431
Raising Homestead Law, 225
Transactions, 311, 312
Stocks, Carl W., 442
Stokowski, L., 820
Storrs, John, 813
Street Traffic and Regulation, 237
Strikes, coal, 522, 534, 535
Clothing, 522
Labor, 531-535
Mining, 522
New Bedford, 534
Textile, 522
Strong, Wendell M., 357
Structural engineering, 580-591
Stuart, Graham H., 58
Submarines, 299
Safety devices for, 621
Suckow, Ruth, 777
Sugar Crop, Virgin Islands, 160
Industry, 329
Suhrie, Ambrose, 842
Sulphuric acid, manufacture of, 694
Supreme Court, 111
District of Columbia, 107
United States, Members, 106, 107
Surgery, 735-737
Surplus Control Bill, 377
Survey, Coast and Geodetic, 212
Air Mapping, 456
Geological, 211

Survey, New York Water Power, 132
San Francisco-San Matteo, 125, 126
Sweden, 322
Refrigeration, 600
Socialist vote, 517
Sweet corn breeding conference, 716
Sweetser, Arthur, 70
Swift, Wiley H., 512
Swing-Johnson Bill, 250
Syndicate, American Marine Insurance, 364
Syria, 66, 67

TAMPA, Shipping, 244
Tank School, 261
Tariff Act, 424
Activities under, 425, 426
Administration of, 423
Commission, United States, 425
Policy of U. S. and South America, 60
Revision, European, 331, 332, 333, 334
Revision, Oriental, 334
Stability, 331
Treaty, 57
Tarkington, Booth, 777
Tax Code of Virginia, 196, 198
Commissions, State, 191
Corporation, 175
Income, 204
Exemptions, 200
State, 190
Federal income, 202, 203
Estate, 175, 207
Excise, 208
Gasoline, 209
Income, 202-205
Inheritance, 207, 208
Legislation, 196-198
Levies, municipal, 194
Motor registration, 209
Municipal Administration of Property, 195
New York Special Franchise, 199
Reduction Bill, 16, 180, 181
Research, 132
Sale Act of New Jersey, 196
State, 118, 119
Gasoline, 190
Income, 190, 203
Property, 189
Taxation, 8, 14, 117
Taxes, automobile and license, 208-210
Chain store, 197
Classified property, 201
Companies' income, 360, 361
Corporation, 197
Corporation and bank, 205
Financial, 196, 197
Gross Receipts, 199, 200
Land and Property, 198-202
License, 190
Mining and severance, 202
Property, 198
State, 189-192
Income, 197
Inheritance, 191, 197
Motor, 190
Taxonomy, 714
Taxpayers, California Association of, 191
Organization, 191
Taylor, H. O., 746
Hugh S., 676
Teacher-Training Conferences, 847, 848
Teachers, Training of, Vocational, 857
Telescope, World's Greatest, 571, 572
Telephones, American Samoa, 162
Transatlantic, 607
And Telegraph Industry, 330
Television, 462, 607
Tellurium, Electrodeposition, 688
Tennessee, County Government, 125
Geological Survey, 666
Novels of, 779
Studies on oil and gas, 217
Terrestrial magnetism, 663-665
Instruments, 665
Territorial Waters, 162
Texas, Civil Service, 105
Oil industry, 328, 404
Silver output, 410
Taxes, 191
Textile industry, 522, 534, 599
Improvement in, 421
Textiles, Increase in output, 432
Period of Depression, 667
Theater, 823-828
Guild, 824
Theological Seminaries, 560, 561
Thermodynamics, 679
Thomas, Norman, 2, 35, 514, 526
Thompson, John, 809
Three-Toed Horse, Discovery of, 709
Tick Fever, 386
Tissues, Changes in Human, 727, 728
Tobacco, 374
Toledo, 136
Tonnage handled, 241
Tomatoes, Investigations, 427
Tomb of Unknown Soldier, 815
Topographic Mapping, 211
Torrey, Charles C., 797
Toscanini, Arturo, 818
Towner, Governor, 150
Trachoma, 739, 740
Trade Associations, 648
Balance of, 320
Control, International, 331
Education, 851, 852, 853
Expansion of, 319, 320
Foreign, 316, 319-323
Competition, 668
Increase in Sales, 433
Indices of, 307, 308, 309, 310
Policy, Most-favored-nation, 332
Preference, Colonial, 331
Restrictions, 331
Unions, 521, 523, 524, 525
Traffic on Railroads, 435
Railroad, 325, 326, 327
Training Camps, Citizens, 260
Reserve Officers, 260
Transatlantic flight, 672
Service project, 451
Telephone, 607
Transmission, 611
Transoceanic telephony, 463
Transpacific flight, 673
Transportation Act, 232
Articles on, 668
Urban, 608, 609
Travel, literature of, 775-776
Treasury Department, Offices of, 91, 92
Saving Certificates, 183, 184
Treaties, 49-51, 55
Arbitration and Conciliation, 68, 69
Commercial, 323, 332
Treaty, Jay, 475
Kellogg, 52
Limitation of Naval Armaments, 619
Sino-British, 63
Tariff, 57
Trenton, 131
Coastal trade, 243
True, Allen, 809
Truesdell, Leon E., 483
Trust Companies, 353, 354
Trusts, life insurance, 359, 360
Tuberculosis, Calmette Vaccine in, 740
Tularæmia, 729
Turkey, 67, 69
American Schools, 65
Commercial treaty with, 323
Pre-war Debt, 65
Separation of Church and State, 544
Turner, J. E., 748
Twelve-Mile Limit, 163
Tyler-Dinda Expedition, 674
William N., 241
Typhoid Fever, Decrease in, 247

UGARTE, MANUEL, Latin-American Policy, 59
Ulcers, Stomach, 735, 736
Underwood, Oscar W., 58
Underwriters' Laboratory, 142
Undulant Fever, 740
Uniform Sale of Securities Act, 340
Securities Law, 340
United Kingdom, Markets of, 322
United States, 52, 55-57
And Argentina, 60, 19
Board of Mediation, 532
Bureau of Public Roads, 208
Chamber of Commerce, 191, 207, 323
Committee, 252
Church Unions, 547
Citizenship, 479-483
Commercial treaties of, 323
Constitution, 208, 479
Department of Agriculture, 336
Commerce, 320
Labor, 474
Justice, 329
Domestic Problems, 77
Economic prosperity, 307, 308

United States, Employees' Compensation Commission, 535
Fisheries, 393
Foreign Service, 45
Geological Survey, 328
Insurance, Fraternal Orders, 362
Industrial, 361
Investments in Nicaragua, 61
Lead production, 415
League of Nations, 54
Marine Force in Nicaragua, 61
Mexican Oil Settlement, 60
Military Problems, 255
Monetary Gold Stock, 348, 349
Naturalization, 479-483
Output of gold, 408
Plate glass, 426
Production of copper, 406
Public Health Service, 741 729
Race Conditions, 469
Relation to Caribbean Area, 76
Foreign, 770
International, 45
League of Nations, 70-76
Oriental and Near Eastern, 63
Pacific Problems, 79
World Court, 70-76
Shipping Board, 449
Steel Corporation, 421
Supreme Court, 199, 200, 207, 361, 474, 475
Tariff of, 67, 68
Autonomy Treaties with China, 63
Commission, 425
Policy of, 60
Treasury, 187, 207
Ware House Act, 639
Western, Earthquakes, 653
World Affairs, 52
Court, 54
Universities, Fellowships, 866
University of Chicago, Library School, 800
College Plan, 845, 846
Virginia, Trust Fund, 867
Ur. archæological finds, 804
Excavations at, 797, 798
Uruguay, Hoover trip to, 59
Utah, bank taxation, 206
Mining taxes, 202
Securities Law, 340
Utilities, 602, 603
Company mergers, 607
Federal Problems of, 605
Investments in, 606
Legislation concerning, 605
Load building, 606
Municipal, 606
Political aspect of, 603, 604
Propaganda concerning, 604
Rate bases of, 602
Sub-metering in, 606

VAN NORMAN, H. E., 386
Vapor plants, 592
Varicose veins, 736, 737
Varney, Burton M., 660
Prohibition, 35
Veblen, Oswald, 571
Venezuela, 322, 328
Lindbergh Flight to, 59
Vermont, Rural Life Survey, 666
Vertebrate Paleontology, 708-710
Zoology, 701
Veterans' Act, World War, 269, 270, 271
Bureau, United States, 268
Citizenship of War, 482
Tax exemptions, 200
Veto, President's use of pocket, 9, 10, 180
Virgin Islands, 158-160, 480
Hurricane Damage, 158
Lindbergh Flight to, 59
Vital Statistics of, 741
Virginia, Administration, 123
County Government, 125
Fiscal Reform, 126
Infected Trees, 114
Judiciary, 124
Legislation, 120, 121
Constitutional, 118
Bank tax, 206
Racial, 472
Securities, 338, 339
Tax, 196, 198, 201
Mental Hygiene Work, 506
Ore deposits of, 218
Production of peanuts, 427
Rock area, 216
School Code, 513
State Administrative Reform, 123, 124
Constitution, 190
Corporation Commission, 118, 338, 339
Taxes, 191
Financial, 196
Gasoline, 197, 209
Income, 203
Inheritance, 208
University of, Seismograph Station, 655
Vital Statistics, 741-744
Vitamin B, Results of investigation, 686
Vitaphone, 828
Vocational Education, 848-861
Legislation, 528
Schools, 837, 838
Volcanoes, 652, 656
Volstead Law, 2, 27, 30

WALLAS, GRAHAM, 77
Walsh, Senator, 12, 604
Resolution, 249
Walters, Dean, 840
War Claims, German, 364
Debts, 19, 184, 185
Department, Officers of, 92
Organization, 272, 273
Warren Act, 222
Senator, 180
Warwick, C. Laurence, 627
Washburn Commemoration, 752
Frederick L., 722
Washington, D. C., 136, 140
Bank taxation, 206
Disarmament Conference, 300, 301
Infant Mortality, 510
Judiciary, 124
Washington, D. C., Legislation, 119
Protestant Episcopal Church, 544
Water Power, 596, 597, 612
Supply, 245-247
Waterways, 241, 286
Inland, 12, 286
Corporation, 287
Importance, 287
Statistics of Freight Traffic, 290
Watson, J. B., 752
Weather Bureau, United States, Broadcasting, 661
Webb, Farmer-Labor, 35
Weizmann, Chaim, 561
Welsh Act, 15
West, Fiction Study of the, 779
Roy O., Appointment of, 16
Warren R., 152
Virginia, Paleontologic Study, 216
Westchester County, Home Rule Association of, 124, 125
Westinghouse Electric Company, 317
Weyl, Hermann, 571
Wharton, Edith, 776, 777
Wheat, Production of, 370, 371, 374, 379
Joseph H., 211
Whitehead, A. N., 751
White Plains, 131
Whitlock, Herbert P., 658
Whitney Studio, 813
Wiechert, E., 665
Wilbur, Ray Lyman, 58
Secretary of the Navy, 61
Wilder, Thornton, 776
Wilkins Expedition, 671, 675
Williams, Frank B., 137
Margaret de Forest Hicks, 45
Wills, Elbert Vaughan, 865
Wilson, George G., 78
G. Lloyd, 323
Hugh R., 75
Tariff Act, 329
Woodrow, 71
Winnetka Plan, 834, 835
Winslow, C. E. A., 739
Charles H., 860
Wisconsin Amendment, 133, 134
Income tax, 197, 204
Labor legislation, 538
Survey of resources, 666
Wissler, Clark, 761
Wittels, Fritz, 497
Wittig, G. F., 247
Wöhler, Friedrich, 731
Wolf, Austin M., 614
Woman labor, 528, 529
Women, Votes of, 4, 31
Wood, Ben D., 868, 869
Industry, 599
Leonard, 155
William R., 180
Woodruff, Clinton Rogers, 97, 128, 130, 132, 141
Wool, Standardization of, 639
Woolley, C. Leonard, 804
Work, Hubert, 2, 16
Workers' Health Bureau, 525
Party, 514

Workmen's Compensation, 113, 152, 366, 527, 528, 535-538
Insurance, 535-538
World Affairs, United States, 52
Conference, Economic, 323, 331
Court, 18, 54, 68
America's Relation to, 70, 71
Sunday School Convention, Los Angeles, 543
War, 309
Wright, James Homer, 728
William H., 573
Wu, C. C., 77
Wylie, Elinor, 777, 783, 784

X-RAYS, 697

YACHTS, 316
Yale Oriental Series, 797
School of Medicine, 843
University, Gallery of Fine Arts, 808
Yellow Fever, 727, 732, 739
Yen, James, 77
Young, Mahonri, 812
Yucatan, Archæological disc
eries, 763
Lindbergh Flight to, 59

ZINC, 330, 413-415
Electrolytic, Increase in p
duction, 688
Institute, 397, 398
Zionist Organizations, Wor
561
Zoning, 112, 137-139, 229
Zoology, invertebrate, 705
Vertebrate, 701
Zorach, William, 812
Zurich, 640

DATE DUE

UIC APR 07 '92

UIC REC'D MAR 23 '92 PM

RENEWALS
996-2724

DEMCO 38-297

3 8198 310 791 825
THE UNIVERSITY OF ILLINOIS AT CHICAGO

THIS BOOK IS FOR USE
ONLY IN THE LIBRARY
IT DOES NOT CIRCULATE